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NATIONAL DAM INSPECTION PROGRAM. NEIFERT CREEK DAM (PA-00654). --ETC(U)
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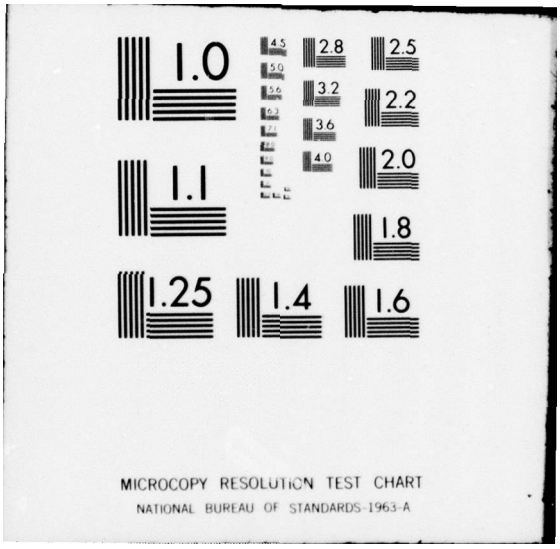
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SCHUYLKILL RIVER BASIN

(1)

NEIFERT CREEK DAM
SCHUYLKILL COUNTY, PENNSYLVANIA
NATIONAL I.D. NO. PA 00654

(6) National Dam Inspection Program. Neifert Creek Dam ID Number (PA-00654), Schuylkill River Basin, Neifert Creek, Schuylkill County, Pennsylvania. Phase I Inspection Report.

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

(15) DACW 31-78-C-0048

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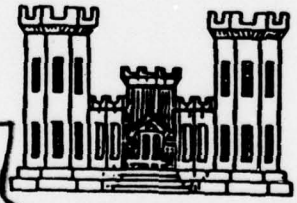

Prepared by:

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Submitted to:

DEPARTMENT OF THE ARMY
Baltimore District, Corps of Engineers
Baltimore, Maryland 21203

June 1978

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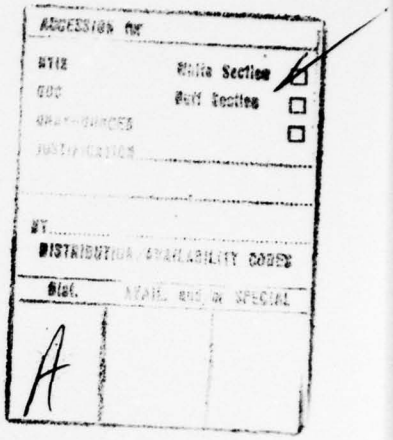


PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

Name of Dam: Neifert Creek Dam
County Located: Schuylkill County
State Located: Pennsylvania
Stream: Neifert Creek
Coordinates: Latitude 40° 50.1' Longitude 76° 0.6'
Date of Inspection: 23 May 1978

Neifert Creek Dam is owned by the County of Schuylkill and was designed by the Soil Conservation Service. The dam was designed solely as a flood retention system to control flows along Neifert Creek which drains into the Little Schuylkill River that flows through Tamaqua, Pennsylvania. Based on the visual inspection, available records and discussions with the Owner, the dam is judged to be in good condition. The spillway systems for this structure have been designed to accomodate the probable maximum flood (PMF) with some freeboard. Considering that the dam is classified as an "Intermediate" size dam with a "Significant" hazard potential, the spillway is considered quite "Adequate".

Visual inspection of the dam and reservoir area did not detect symptoms of uncontrolled seepage, instability, deterioration or other conditions that would suggest impending hazardous conditions. Only one small seep, with practically imperceptible seepage, was observed near the downstream toe of the dam, approximately 20 feet upstream of the impact basin. The visual inspection of the principal and emergency spillways did not reveal any evidence of deterioration or instability.

In summary, examination of the structures, and review of the available data revealed no evidence or conditions detrimental to the integrity of Neifert Creek Dam and its appurtenant structures. There are no additional studies recommended. However, it is recommended that the following measures be undertaken by the Owner during routine maintenance of the dam and its appurtenances.

All woody vegetation should be removed from the emergency spillway channel and side hill slopes to prevent deterioration of the spillway. Since the structure does not impound a significant head of water, desiccation of the embankment is possible. Therefore, it is recommended that the embankment be inspected at least annually for desiccation cracks and signs of uncontrolled seepage or stress during periods of high pool level. Should cracks develop, it is recommended that any crack areas be scarified, regraded, compacted and revegetated. The structure should also be inspected after each severe storm to determine if a hazardous condition is developing.

In conjunction with the annual maintenance program, it is recommended that the Owner develop a maintenance inspection checklist to insure that all critical items are inspected periodically. A formal warning system and surveillance program should be developed for use in the event of an emergency.

John H. Frederick, Jr., P.E.
Maryland Registration 7301

8/2/78
Date

W S Gardner

William S. Gardner, P.E.
Penna Registration 004302E

8/2/78
Date

APPROVED BY:

John H Kenworthy

JOHN H. KENWORTHY
LTC, Corps of Engineers
Acting District Engineer

DATE: 23 August 1978

OVERVIEW
NEIFERT CREEK DAM, SCHUYLKILL COUNTY, PENNSYLVANIA

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM
NEIFERT CREEK DAM
NATIONAL ID #PA 00654
DER ID #54-173

SECTION 1
PROJECT INFORMATION

ABSTRACT

1.1 General.

a. Authority. The Dam Inspection Act, Public Law 92-367, authorized the Secretary of the Army, through the Corps of Engineers, to initiate a program of inspection of dams throughout the United States.

~~b.~~ Purpose. The purpose of the inspection is to determine if the dam constitutes a hazard to human life or property.

ABSTRACT

1.2 Description of Project.

a. Dam and Appurtenances. Neifert Creek Dam is a zoned earth fill structure. The maximum height of the dam is 55 feet and it has a crest length across the valley of approximately 645 feet. The total estimated volume of fill in the embankment is approximately 97,200 cubic yards.

Records indicate that the embankment materials are composed of silty clay and gravelly clay. An inclined exterior slope and toe drain is provided at the downstream toe between Stations 4+20 and 7+80. The rock extends up to elevation 1088.0 and has been installed to relieve the seepage pressure through the embankment and in the weathered bedrock. The crest width of the dam is 18 feet. In accordance with the available SCS drawings, the upstream constructed slope is 2.91H:1V. The downstream slope has been constructed on a 1.94H:1V slope.

The dam was designed with a cutoff trench oriented along the centerline of the dam. The trench was designed to have a 20-foot base width and rise on 2H:1V slopes. A typical section of the embankment is enclosed as Plate 3. The principal spillway consists of a reinforced concrete single stage riser with a weir crest elevation of 1086.0 and a 30-inch diameter reinforced concrete outlet pipe. The pipe is

buried beneath the embankment and discharges into an impact basin at the downstream toe. A 20-foot long riprap lined channel conveys water from the basin to an unlined channel which joins the natural stream channel. The bottom width of the riprap channel is 12 feet and has side slopes of 2H:1V.

Reservoir drawdown can be accomplished by a 24-in. diameter pipe with an invert at elevation 1071.5. The pipe is located at the base of the principal intake structure and can be opened from the top of the principal spillway. The invert is located about 50 feet into the reservoir and the pipe discharges into the 30-inch principal spillway pipe.

The emergency spillway is located in the left abutment. The channel is excavated into the natural bedrock. The bottom width of the channel is 130 feet. The side slopes were excavated on a slope of 0.25H:1V into the weathered rock. Above the rock line, excavation is in natural soil and has side slopes of 3H:1V. The approach channel floor is horizontal and has a length of approximately 250 feet. Beyond Station 3+88.6 along the spillway centerline, the channel floor has a grade of +2.5 percent.

An earth dike is constructed along the inside slope between the channel and the embankment to protect the downstream toe of the earth dam in the event of flow in the emergency spillway channel. This channel discharges directly into the natural streambed.

b. Location. The dam is located on Neifert Creek approximately 2,000 feet upstream of the confluence of the Little Schuylkill Creek with Neifert Creek. The dam and reservoir site is located in Rush Township, Schuylkill County, Pennsylvania. Neifert Creek was built concurrently with Little Schuylkill Dam, which is located on the Little Schuylkill River, about 800 feet east of Neifert Creek Dam. The dam site and reservoir are shown on USGS Quadrangle Delano, Pennsylvania, at coordinates N40° 50.1', W76° 0.6'. A Regional Location Plan of Neifert Creek Dam and Reservoir is enclosed as Plate 1, Appendix E.

c. Size Classification. The dam is classified as "Intermediate" by virtue of its 55 feet height. The current storage at normal pool is insignificant. However, the flood storage is estimated to be 545 acre-feet.

d. Hazard Classification. A "Significant" hazard classification is assigned because there are no inhabitable structures downstream that would be affected by a flood wave produced by the failure of the dam while storing a full pool of water. The flood wave produced at peak storage in the event of failure is judged to dissipate before it reaches the town of Tamaqua and would not cause significant damage.

e. Ownership. Schuylkill County Commissioners.

f. Purpose of Dam. Flood control. The small pond located behind the structure has been stocked and is currently used for fishing.

g. Design and Construction History. Neifert Creek Dam was designed by the Soil Conservation Service. Associated with this design, the Soil Conservation Service produced a 15-sheet set of drawings (Drawing No. PA-422A-P), dated April 1966. The Soil Conservation Service also prepared the specifications for these drawings which were reviewed. This dam was constructed under the provisions of the Watershed Protection and Flood Prevention Act, with the assistance of the Soil Conservation Service of the U.S. Department of Agriculture.

Construction started September 19, 1966. The Contractor for this work was Schwartz and Baker, Clarks Summit, Pennsylvania. Work was terminated during the winters of 1966-67 and 1967-68, and resumed again on May 15, 1968. The dam and appurtenant structures were essentially completed on June 7, 1968 and inspected by the Soil Conservation Service on June 7, 1968. During the course of construction, Mr. John W. Mickley was the appointed Resident SCS Engineer to oversee the construction. Mr. Eugene H. LaBar was appointed the on-site SCS inspector. The Department of Environmental Resources, Harrisburg, Pennsylvania, performed the final inspection on June 11, 1968.

h. Normal Operating Procedures. The dam was designed to impound a 5.5 acre pool at normal pool elevation of 1086.0. Excess water is discharged over a weir at the principal intake structure. Beyond the spillway capacity, excess water is temporarily impounded behind the embankment. Should low frequency storms occur which cannot be handled by the principal spillway, the excess water is impounded to elevation 1113.6; thereafter, flood water is discharged over the emergency spillway and into the downstream channel immediately below the principal spillway exit structure.

1. Pertinent Data.

A summary of pertinent data is tabulated as follows:

a.	Drainage Area (sq. miles)	3.1
b.	Discharge at Dam Site (cfs)	
	Max. Known Discharge	unknown
	Discharge w/reservoir level @ crest of emergency spillway (El. 1113.6)	133
	At Design High Water (El. 1119.4), emergency spillway discharge	4600
	At Top of Dam, Emergency Spillway Discharge	9400
c.	Elevations (feet)	
	Top of Dam	1121.5
	Emergency Spillway Crest	1113.6
	Normal Pool/Principal Spillway Crest	1086.0
	Emergency Drawdown Intake Invert	1071.5
d.	Reservoir (feet)	
	Length @ Normal Pool	800
	Length at Design High Water Pool (El. 1119.4)	4600
e.	Storage (acre feet)	
	Sediment (to El. 1086.0)	36
	To Emergency Spillway Crest	581
	To Top of Dam	937
f.	Reservoir Surface Area (Acres)	
	Normal Pool	6 (approximately)
	Design High Water	51
g.	Dam Data	
	Type	Zoned earth fill with rock fill toe
	Length	645 ft.
	Height	54 ft. (from foundation)
	Top Width	18 feet
	Side Slope - Upstream	2.91:1 (H:V)
	- Downstream	1.94:1 (H:V)
	Cutoff	Trench to rock line
	Grout Curtain	None

h. Principal Spillway	
Type	Reinforced Concrete Riser
Size	Inside Dimensions: 2'6"x7'6"
Crest	1086.0 ft.
Discharge Conduit	
Diameter	30 inches
Length	271.4 feet
Outlet Elevation	1063.0
Emergency Drawdown	
Size	24-inch pipe to riser
Intake Elevation	1071.5
i. Emergency Spillway	
Type	Channel cut through Rock
Crest Elevation	1113.6 ft.
Width	130.0 ft.
Length	400 ft. along centerline

SECTION 2
ENGINEERING DATA

2.1 Design.

a. Data Available. A summary of engineering data on Neifert Creek Dam is presented in the Checklist, attached as Appendix A. Engineering design data available for Neifert Creek Dam was contained primarily in the 15-sheet set of design drawings, dated April 1966, as prepared by the Soil Conservation Service. A set of these drawings is in the Owner's possession and at the Commonwealth of Pennsylvania, Department of Environmental Resouces main office in Harrisburg, Pennsylvania. Other documents available and reviewed are listed in Appendix A.

The SCS archives located in Mechanicsburg, Pennsylvania contain complete files on the design and construction of the dam including the following: Soil Mechanics and Geology reports, design folder, drawings and construction documentation including daily records, field testing results for both concrete and embankment construction.

b. Design Features. The principal design features of Neifert Creek Dam are illustrated on the plans and profiles of the embankment and appurtenant structures, enclosed herein as Appendix E, Plates 2 through 6. All of these plates are reproduced from the Soil Conservation Service drawings. As shown on the drawings, the dam is basically a homogeneous earth embankment with a small coarser zoned section downstream and a downstream inclined drainage blanket which is keyed into rock. The drawings show the embankment to have a maximum height of approximately 55 feet with an 18 foot wide crest. The upstream constructed slope is 2.91H:1V with a 1.94H:1V downstream slope.

Underseepage is controlled by a 20 foot wide cutoff trench excavated approximately 10 feet into the rock foundation. Although it is highly unlikely that seepage would develop through the dam during a flood retention period, embankment seepage can be controlled by a combined inclined and a toe drain on the downstream slope. The up-

stream slope is riprapped below elevation 1087. Above 1087, the embankment is grass-covered. Typical cross-sections of the principal spillway and emergency spillway are enclosed as Plates 4 and 5, respectively. Further details are presented in Section 1.2.

2.2 Construction.

a. Construction documentation contained in the DER files was limited to a series of miscellaneous letters, notes and memoranda. SCS files contain complete construction documentation. Clearing of the site was started September 19, 1966. Work was shut down for the winter on December 7, 1966 and resumed June 5, 1967. Work was again shut down on December 27, 1967 until May 15, 1968. By June 7, 1968, construction was complete.

2.3 Operation Data.

Since this impoundment was designed as a single purpose flood control system, normal storage is insignificant behind the embankment. No reservoir water surface elevation records are maintained nor are there any staff gages or other types of recording equipment evident. There are also no minimum downstream flow requirements.

2.4 Evaluation.

a. Availability. Data reproduced and evaluated in this report was provided, principally, by the Pennsylvania Department of Environmental Resources and, secondarily, by the Soil Conservation Service. The DER files indicate that a complete set of design computations were forwarded to the Department of Environmental Regulations. The complete set of design computations, including Soil Mechanics and Geology reports, are on file in the SCS archives.

b. Adequacy. Since the design data and construction data located in DER files was limited, the final assessments of this investigation were based primarily on the visual inspection, construction reports by the County representatives and the hydrologic/hydraulic analyses performed as part of this investigation. Subsequently, SCS files were reviewed and confirmed the original assessments.

c. Validity. Design drawings showed the proposed borrow source for the embankment to be located west of the dam and on the north side of the reservoir. Visual inspection tends to confirm this location. Based on the visual inspection, construction photographs (six) and the design drawings, it is believed that the dam and appurtenances were most likely constructed in accordance with specifications. The exposed features of the structure noted during the visual inspection agree with the design drawings, further confirming that the dam was constructed as designed.

SECTION 3
VISUAL INSPECTION

3.1 Findings.

a. General. The observations and comments of the field inspection team are contained in the Checklist enclosed herein as Appendix B, and are summarized and evaluated as follows. In general, the appearance of the facility indicated that the dam and its appurtenances were properly constructed and observed to be in good condition.

b. Dam. During the visual inspection, there were no indications or evidences observed of distortions in alignment or grade that would be indicative of movement of the embankment or the foundation. All slopes appeared to be in good condition and the crest, although unprotected, was also evaluated to be in good condition. Some erosion was noted along the crest and along the upstream slope which can be attributed to motor bike traffic. One small seep, located as shown on Plate 2 of Appendix E, was noted during this inspection. A photograph of this seep is enclosed herein as Photo No. 6.

c. Appurtenant Structures. At the time of this inspection, water was flowing through the principal spillway. The exposed portions of the intake riser were inspected and found to be in good condition. There was no trash noted around the riser. The conduit extending into the dam could not be inspected, but the outlet impact basin was inspected. The exposed portions of this basin were observed to be in excellent condition. The riprap channel immediately downstream of the impact basin was also in good condition.

The emergency spillway was inspected and observed to be in very good condition. There was no spalling, cracking or distortions observed along the concrete sill. The side channel slopes appeared to be stable with only slight amounts of vegetation growing in the rock joints. The approach channel appeared to be stable and well-vegetated. Similarly, the downstream channel was also well-vegetated and stable.

d. Reservoir. Although the reservoir is relatively small, there was no evidence of significant siltation, slope instability, or other features that would significantly effect the flood storage capacity of the reservoir. The natural ground above the permanent pool elevation to the emergency pool elevation was also inspected. These slopes appeared stable and well-vegetated with trees or dense grass.

e. Downstream Channel. The downstream channel was inspected from the impact basin to the confluence with Little Schuylkill Creek. This channel appears to be stable. Side slopes are moderate and well vegetated. There were no inhabitable structures observed downstream along the flood plain zone until the creek reaches Tamaqua. The town of Tamaqua is approximately 4.8 miles downstream and the flood wave produced by dam failure would have dissipated by the time it reached the town. State Highway Route 54 is the only road along the stream channel between the dam and Tamaqua and damage would be expected to be minimal.

3.2 Evaluation.

The survey of the dam disclosed no evidence of apparent, past or present movement to indicate instability of the embankment. One minor seep was observed on the downstream slope of the dam immediately above the stilling basin structure. The rate of flow from this seep is practically imperceivable. All appurtenant structures inspected, which included the principal spillway riser, impact basin and emergency spillway were observed to be in good to excellent condition.

SECTION 4
OPERATIONAL PROCEDURES

4.1 Procedures.

The reservoir level is regulated by discharge over the concrete riser weir at elevation 1086.0. During periods of high runoff, flood water is temporarily stored behind the embankment and allowed to discharge through the outlet riser. If the flood storage capacity is exceeded, excess water would be discharged over the emergency spillway at elevation 1113.6. There are no operational records available noting maximum elevations of the pool during extreme rainfalls.

4.2 Maintenace of the Dam.

The dam is maintained by the County, which issues a contract with a local contractor to perform yearly maintenance on the structure. Typically, this work involves the cleaning of trash racks around the intake riser, mowing the grass, and general rehabilitation of the appurtenant facilities.

4.3 Maintenance of Operating Facilities.

Since the operating facilities are extremely simple, maintenance work is limited to yearly inspections and the cleaning of these structures. At the time of this inspection, all of the structures were clean and appeared to be well maintained.

4.4 Warning Systems in Effect.

There are no warning systems or procedures established to be followed during periods of exceedingly heavy rainfall. It is reported that the structure is monitored by the Civil (local) Defense Unit.

4.5 Evaluation.

It is believed that the current operating procedures are reasonably realistic means of operating the relatively simple control facilities at Neifert Creek Dam. Furthermore, it is believed that the maintenance procedure is a reasonable one to maintain this system. There is no

resident tender, nor is it believed that one is required. However, after high flows, it is recommended that the intake structures be inspected to insure that they are not clogged. An evaluation of the access road indicates that the road is accessible during low frequency high runoff storms.

SECTION 5
HYDROLOGY/HYDRUALICS

5.1 Evaluation of Features.

a. Design Data. Available design data was limited to statements in the Application Report, dated June 2, 1966, and preliminary design statements in the work plan prepared by the Soil Conservation Service in 1958. Supplemental data located in the DER files included a letter of transmittal for the construction plans and flood routings. These files also contained a design folder which included specifications, design computations, geologic report and soils laboratory report. However, only the construction plans were in the files and made available for this investigation.

The original drainage area is listed in the Application Report and on the construction drawings and confirmed by the latest USGS maps is 3.09 square miles. The watershed is leaf-shaped, 3.1 miles long and 2.0 miles wide at its widest location. Elevations range from 1940 in the upper regions to 1086 at the normal reservoir level. The upper reaches of the reservoir are steep and wooded. The valley gradient flattens out such that a large, approximately 30 acres, marshy area is about one mile upstream of the reservoir. A temporary storage afforded by the marsh area is expected to have no significant effect during an extreme event. The whole watershed is approximately 50 percent wooded, 10 to 15 percent residential with some growth expected in the near future. It is possible that some strip mining may eventually commence within the watershed area which would tend to increase the runoff and produce more sediment in the reservoir area.

Information obtained from the Application Report indicated the hydrologic/hydraulic design of the dam was based on procedures outlined in the SCS National Engineering Handbook, Section 4. The crest of the principal riser was set at an elevation to provide an estimated 50 years of sediment storage, 36 acre-feet. The crest of the emergency spillway was set at an elevation to provide flood storage for at least a 100-year, six hour storm with an antecedent moisture condition III, which represents a high runoff from an already wet ground surface.

A design high water elevation was determined by routing runoff of 10.31 inches. The crest of the dam was set by routing a runoff of 19.41 inches, the estimated PMF runoff. The discharge through the emergency spillway when the reservoir level is at the top of the dam is given as 9400 cfs.

In accordance with the criteria established by the Federal (OCE) Guidelines, the recommended spillway design flood for this Intermediate Size dam and Significant Hazard Potential classification is one-half the probable maximum flood (PMF) to the PMF.

b. Experience Data. Records are not maintained either of discharge through the spillway systems or of reservoir water level elevations. It is unknown what the maximum water level has been in the reservoir.

c. Visual Observations. At the time of this inspection, no conditions were observed that would indicate that the outlet capacity would be significantly reduced during a flood occurrence. Observations regarding the downstream channel condition and spillway condition and reservoir are located in Appendix B.

d. Overtopping Potential. As flood routing, calculations, etc., were not in the DER files, an evaluation of the statements made in the Application Report is made by approximate methods as contained in Appendix C. Sheets 4 and 5 of Appendix C indicate that the discharges are reasonable. Sheet 6 indicates that the estimated PMF peak inflow, based on information supplied by the Corps of Engineers, is less than the discharge capacity of the spillway. It is to be noted that design inflow hydrographs developed according to SCS criteria tend to be conservative for these small watersheds. Therefore, the structure is judged capable of passing the estimated PMF without overtopping.

Subsequent to the above evaluation, the SCS files were retrieved from the archives and reviewed. The freeboard hydrograph peak inflow was calculated to be 10,119 cfs. The routed storm produced the peak outflow of 9,400 cfs with a reservoir water level of elevation 1121.5. Therefore, the original spillway adequacy assessment of "Adequate" is confirmed by the review of design computations.

e. Spillway Adequacy. The estimated peak inflow of 5190 cfs is less than the combined riser and spillway capacity of more than 9400 cfs (at the crest of the dam). Therefore, the spillway passes 100 percent of the PMF leaving some freeboard. The spillway is classified as "Adequate". The tailwater is estimated to be approximately 23 feet or more below the top of the dam during the passing of the PMF.

f. Downstream Conditions. Neifert Creek Dam is a flood control structure built in conjunction with the Little Schuylkill Dam. The drainage area controlled by the Little Schuylkill is approximately 15.6 square miles. Neifert Creek joins the Little Schuylkill approximately 2,500 feet downstream of Neifert Creek Dam. The channel passes through a 400 foot wide, wooded flood plain. Approximately 3,000 feet downstream of the dam is the Central New Jersey Railroad tressel. The potential for downstream damage was analyzed in 1958 by the SCS as part of the watershed work plan for Neifert Creek. A section of this work plan is quoted as follows:

> "Severe flooding damage occurs periodically at Tamaqua (population 12,000), at Reynolds, location of the Atlas Powder Company, and on several other reaches along the river. Flooding damages start between a 5- and 10-year frequency of occurrence. The high stream gradient produces velocities capable of causing great damage even at bankfull stages to the Reading Railroad's main branch along the Little Schuylkill River".

During passing of the PMF, a difference of approximately 25 feet between the reservoir water level and tailwater elevation is expected. If Neifert Creek fails during the PMF, the hazard for loss of life would be expected to be insignificant and damage to property would be expected to be minimal.

SECTION 6
STRUCTURAL STABILITY

6.1 Evaluation of Structural Stability.

a. Visual Observations. The visual observations did not indicate any existing embankment stability problems. Only one small spring with practically imperceptible flow was observed near the downstream toe of the dam, approximately 20 feet upstream of the impact basin. However, with the low pool at the time of inspection, observations for structural integrity were of limited value.

b. Design and Construction Data. Available design data was listed in Appendix A and described in Section 2 of this report as noted.

c. Operating Records. Since the dam and reservoir have been designed to operate without valves or other mechanically operated devices, there are no operation records.

d. Post-Construction Changes. There are no reports nor is there any evidence that modifications of the dam and appurtenant structures were made.

e. Seismic Stability. This dam is located in Seismic Zone I. Normally it can be considered that if a dam in this zone is stable under static loading conditions, it can be assumed safe for any expected earthquake conditions. Since there were no formal static stability analyses available for review, the theoretical seismic stability of the dam cannot be assessed.

SECTION 7
ASSESSMENT/REMEDIAL MEASURES

7.1 Dam Assessment.

a. Assessment. The visual inspection and design use of Neifert Creek Dam indicates that the dam embankment and foundation is performing satisfactorily. Overall the appearance and condition of both the dam and appurtenant facilities is good. Only one clear, almost imperceptible seepage zone was located near the downstream toe of the dam. At present, this seep is not a hazard to the integrity of the dam.

There was no spalling or deterioration of the principal intake structure noted. Similarly, no potential detrimental spalling or deterioration of the emergency spillway concrete sill was noticed. Both the principal and emergency spillways appear to be in good condition. Vegetation in the principal spillway should be controlled and trees should not be allowed to develop. The hydrologic and hydraulic analyses performed by SCS and supplemental calculations performed using Corps of Engineers' criteria indicates that the structure would pass the PMF event. Thus, the spillway is considered "Adequate".

b. Adequacy of Information. Details of the structural stability and other design features of the embankment and appurtenant facilities are available through the SCS State Office in Harrisburg, Pennsylvania. The assessment of the embankment stability and its appurtenant structures was based primarily on the visual inspection, hydrologic and hydraulic analyses available in DER files and the supplemental hydrologic/hydraulic analyses performed. Subsequent review of the SCS files containing complete design and construction documentation confirmed the original assessment.

c. Urgency. It is suggested that the recommendations presented below be implemented during the maintenance program currently in progress.

d. Necessity of Additional Studies. Based on the data reviewed, no additional studies are recommended.

7.2 Remedial Measures.

a. Facilities. It is recommended that the following remedial measures be undertaken.

1. During the yearly maintenance program, all woody vegetation should be removed from the emergency spillway channel and emergency spillway side slopes to prevent deterioration of the system.

2. In addition to removing the debris from the principal intake structure, debris around the edges of the existing impoundment should be removed to minimize the possibility of clogging the intake structure during low frequency storms.

3. Since the embankment does not impound a significant head of water, desiccation of the embankment materials is possible. This would be evidenced by shrinkage cracks which could develop into erosion gullies. During the routine maintenance program and inspections, it is recommended that the embankment slope be thoroughly inspected for evidence of shrinkage cracks. Should cracks develop, it is recommended that the area be scarified, regraded, compacted and revegetated.

b. Operation and Maintenance Procedures. Because of the location of the dam upstream from a populated area (Tamaqua), a formal procedure of observation and warning during periods of high precipitation should be developed and implemented. The Owner should also develop a maintenance inspection checklist to help insure that all critical items are inspected on a periodic basis.

APPENDIX

A

CHECK LIST
ENGINEERING DATA
DESIGN, CONSTRUCTION, OPERATION
PHASE I

NAME OF DAM *Neifert Creek Dam*

ID # *PA 00654*

ITEM	REMARKS
AS-BUILT DRAWINGS	*DER files contained a full size and half size 15 sheet set of design drawings, No. PA-422A-P. SCS archive files Mechanicsburg, Pennsylvania contain as-built drawings.*
REGIONAL VICINITY MAP	*Yes. See SCS design drawings, Sheet 1 of 15.*
CONSTRUCTION HISTORY	*None in DER files except a few letters which mentioned percent completion or specific items which were complete. Two sets of field books, "Job Diary" and "Construction Records" are on file at SCS archives.*
TYPICAL SECTIONS OF DAM	*Yes. See SCS design drawings.*
OUTLETS - PLAN DETAILS CONSTRAINTS	*Yes. See SCS design drawings.*
DISCHARGE RATINGS	*Are in SCS files.*
RAINFALL/RESERVOIR RECORDS	*None available.*

ITEM	REMARKS
DESIGN REPORTS	*None in DER files, complete records located in SCS archives.*
GEOLOGY REPORTS	*None in DER files but a geology section is presented in the application form. Geologic information was found in the U.S. Geological Survey Geologic Quadrangle maps GQ 1133 and GQ 1054. Bedrock is Mauch Chunk formation and consists of sandstone and shale. A Geology report was also found in the SCS archives.*
DESIGN COMPUTATIONS HYDROLOGY & HYDRAULICS DAM STABILITY SEEPAGE STUDIES	*A letter dated May 6, 1966 to Mr. Lunetta from Mr. Right (SCS) indicates the transmittal of Construction Plans, Flood Routings, geology, soils data, and specifications but this data was not found in DER files. Design computations are located in SCS archives.*
MATERIALS INVESTIGATIONS BORING RECORDS LABORATORY FIELD	*SCS design documents contained test boring data and compaction curves. Field test documentation located in SCS archives.*
POST-CONSTRUCTION SURVEYS OF DAM	*None.*
BORROW SOURCES	*SCS design plans showed potential borrow sources*

ITEM	REMARKS
MONITORING SYSTEMS	*None.*
MODIFICATIONS	*None.*
HIGH POOL RECORDS	*None available.*
POST CONSTRUCTION ENGINEERING STUDIES AND REPORTS	*None.*
PRIOR ACCIDENTS OR FAILURE OF DAM DESCRIPTION REPORTS	*None.*
MAINTENANCE OPERATION RECORDS	*None.*

ITEM	REMARKS
SPILLWAY PLAN SECTIONS DETAILS	*This data is provided in SCS drawings PA-422A-P sheets 1 through 15.*
OPERATING EQUIPMENT PLANS & DETAILS	*None. However, it is only a flood control structure and the normal reservoir is quite small.*
CONSTRUCTION	*The contract was awarded to Schwartz and Baker, 285 E. Grove Street, Clarks Summit, Penna. on February 8, 1967. Other details were not available.*
PHOTOGRAPHS	*Eleven (11) photos were found in DER files showing construction phases and the completed structure.*

APPENDIX

B

CHECK LIST
VISUAL INSPECTION
PHASE I

Name Dam *Neifert Creek Dam* County *Schuylkill* State *Pennsylvania* National ID # *PA 00654*

Type of Dam *Rolled Earth* Hazard Category *Significant*

Date(s) Inspection *May 23, 1978* Weather *Mild* Temperature *65-70° F*

Pool Elevation at Time of Inspection *1086.1* M.S.L. Tailwater at Time of Inspection *1064 ±* M.S.L.

Inspection Personnel:

Mary Beck (Hydrologist) *Vince McKeever (Hydrologist)*

John Boschuk, Jr. (Geotechnical/Civil) *Ray Lambert (Geologist)*

John H. Frederick, Jr. (Geotechnical)

John Boschuk, Jr. Recorder

Remarks:

Mr. Hugo Subrime- Owner's representative was on site and provided assistance, as necessary.

CONCRETE/MASONRY DAMS

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
ANY NOTICEABLE SEEPAGE	*N/A*	
STRUCTURE TO ABUTMENT/EMBANKMENT JUNCTIONS	*N/A*	
DRAINS	*N/A*	
WATER PASSAGES	*N/A*	
FOUNDATION	*N/A*	

CONCRETE/MASONRY DAMS

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SURFACE CRACKS CONCRETE SURFACES	*N/A*	
STRUCTURAL CRACKING	*N/A*	
VERTICAL AND HORIZONTAL ALIGNMENT	*N/A*	
MONOLITH JOINTS	*N/A*	
CONSTRUCTION JOINTS	*N/A*	

EMBANKMENT

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SURFACE CRACKS	*None observed.*	
UNUSUAL MOVEMENT OR CRACKING AT OR BEYOND THE TOE	*None observed.*	
SLOUGHING OR EROSION OF EMBANKMENT AND ABUTMENT SLOPES	*No significant erosion was observed but motor bike traffic on the slope can be seen and will most likely be a source of erosion in the future.*	
VERTICAL AND HORIZONTAL ALIGNMENT OF THE CREST	*No movements observed.*	
RIPRAP FAILURES	*None observed.*	

EMBANKMENT

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
JUNCTION OF EMBANKMENT AND ABUTMENT, SPILLWAY AND DAM	*There is some very minor erosion at the embankment/abutment contact but it appears to be relatively stable.*	
ANY NOTICEABLE SEEPAGE	*A 5 foot diameter wet area is located on the west (upstream) side of the concrete sill located in the emergency spillway at its northern most limit. Seepage was observed near the left abutment (north) toe of the dam. Flow was traced in a 3-6 foot wide wet area to discharge outlet area in center of dam's downstream face. A spring (?) was located approximately 300 feet Northeast of left abutment (downstream) in an area of wasted boulders (flow approximately 3-5 gpm).*	
STAFF GAGE AND RECORDER	*None.*	
DRAINS	*None.*	

OUTLET WORKS

Principal Spillway

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CRACKING AND SPALLING OF CONCRETE SURFACES IN OUTLET CONDUIT	*None observed.*	
INTAKE STRUCTURE	*The system consists of a single stage concrete overflow riser with a weir crest of 1086. The trash rack was clean.*	
OUTLET STRUCTURE	*This system consists of a 30 inch diameter reinforced concrete pipe buried in the embankment and approximately 272 feet long. It discharges into an impact basin with a baffle wall energy dissipater.*	
OUTLET CHANNEL	*The outlet channel is 12 feet wide and riprap lined for the first 20 feet downstream of the impact basin. It appears to be in good condition. Thereafter, the water flows into the natural stream channel.*	
EMERGENCY GATE	*None.*	

UNGATED SPILLWAY

Emergency Spillway

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONCRETE WEIR	*A 3 foot wide, 3 foot deep and 130 foot long concrete sill crosses the rock bottom emergency spillway. Top of the wall is reported to be at elevation 1113.6. The spillway appears to be in good condition, see photo 3.*	
APPROACH CHANNEL	*The approach channel is 130 feet wide and appears to have a reverse grade of approximately 2 % but was designed as a level section. It has a minimum length of 100 feet.*	
DISCHARGE CHANNEL	*The discharge section downstream of the concrete sill drains at an approximate 2.5 % grade for the first 115 feet. Thereafter, the slope increases to approximately 60 % and drains into the natural streambed (see photo 4).*	
BRIDGE AND PIERS	*None at the dam. The nearest bridge is a steel railroad tressel several hundreds of feet downstream of the dam on Little Schuylkill Creek.*	
VEGETATION	*Some woody plants are growing in the emergency spillway and should be removed before they become trees.*	

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONCRETE SILL	*None.*	
APPROACH CHANNEL	*None.*	
DISCHARGE CHANNEL	*None.*	
BRIDGE AND PIERS	*None.*	
GATES AND OPERATION EQUIPMENT	*None.*	

INSTRUMENTATION

VISUAL EXAMINATION	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
MONUMENTATION/SURVEYS	*None.*	
OBSERVATION WELLS	*None.*	
WEIRS	*None.*	
PIEZOMETERS	*None.*	
OTHER	*None. The nearest rain gage is at Still Creek Dam (National I.D. PA 00700 , DER I.D. No. 54-111).*	

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SLOPES	*The reservoir side slopes are flat to moderate and well vegetated with trees and dense grass cover. There are a few erosion gullies but they are not significant relative to flood storage. The reservoir is relatively empty because it is used primarily for flood storage.*	
SEDIMENTATION	*There is some sedimentation at the upper end of the reservoir (not significant as far as reducing available flood storage). Debris at the upper end and right shore line may have some effect on reducing flow through the principal spillway by clogging the trash racks. It will have little or no effect on the emergency spillway.*	

DOWNSTREAM CHANNEL

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONDITION (OBSTRUCTIONS, DEBRIS, ETC.)	*There is one high railroad tressel downstream on the Little Schuylkill Creek.*	
SLOPES	*The channel bottom is on rock and the channel side slopes are rock. The stream channel gradient is approximately 5 % immediately below the dam.*	
APPROXIMATE NO. OF HOMES AND POPULATION	*Neifert Creek drains into the Little Schuylkill Creek which flows through the town of Tamaqua approximately 4.8 miles downstream from the confluence of Neifert and Little Schuylkill Creeks.*	

APPENDIX

C

NEIFERT CREEK DAM
CHECK LIST
HYDROLOGIC AND HYDRAULIC
ENGINEERING DATA

DRAINAGE AREA CHARACTERISTICS: *Moderate to steep slopes, about 50% wooded.*

ELEVATION TOP NORMAL POOL (STORAGE CAPACITY): *1086.0 (36 Ac-Ft)*

ELEVATION TOP FLOOD CONTROL POOL (STORAGE CAPACITY): *1113.6 (545 Ac-Ft)*

ELEVATION MAXIMUM DESIGN POOL: *1119.4*

ELEVATION TOP DAM: *1121.5*

EMERGENCY SPILLWAY:

a. Elevation *1113.6*

b. Type *Channel cut through rock.*

c. Width *130 feet*

d. Length *400 feet along center line.*

e. Location Spillover *Left abutment*

f. Number and Type of Gates *None*

PRINCIPAL SPILLWAY:

a. Type *Concrete riser and conduit.*

b. Location *180 feet from left abutment.*

c. Entrance inverts *1086.0*

d. Exit inverts *1063.0*

e. Emergency draindown facilities *50 feet of 24 inch pipe*

HYDROMETEOROLOGICAL GAGES:

a. Type *None*

b. Location

c. Records

MAXIMUM NON-DAMAGING DISCHARGE: *This structure controls only a small portion of the watershed above Tamaqua; therefore, no attempt has been made to estimate the maximum non-damaging discharge.*

DAM SAFETY ANALYSIS
HYDROLOGIC/HYDRAULIC DATA

Date: 6/12/78
By: MFB
Sheet: 2 of 6

DAM Neifert Creek Dam Nat. ID No. PA 654 DER No. 54-173

	ITEM/UNITS	Permit/Design Files (A)	Calc. from Files/Other (B)	Calc. from Observations (C)
1.	Min. Crest Elev., ft.	1121.5 ft.		
2.	Freeboard, ft.			
3.	Spillway(1) Crest Elev, ft.	1086.0 ft		
3a.	Secondary(2) Crest Elev, ft.	1113.5 ft.		
4.	Max. Pool Elev., ft.	1119.4 ft.		
5.	Max. Outflow(3), cfs	9400 cfs		
6.	Drainage Area, mi^2	3.1 mile^2		3.19 sq. mile
7.	Max. Inflow(4), cfs			
8.	Reservoir Surf. Area, ft^2			
9.	Flood Storage	545 Ac-Ft.		
10.	Inflow Volume, ft^3			

Reference all figures by number or calculation on attached sheets:

Example: 3A - Drawing No. xxx by J. Doe, Engr., in State File No. yyyy.

NOTES:

(1) Principal spillway

(2) Emergency spillway

(3) At maximum pool, with freeboard, ungated spillways only.

(4) For columns B, C, use PMF

Date: 6/12/78
By: MFB
Sheet: 3 of 6

HYDROLOGIC/HYDRAULIC CALCULATIONS (cont.)

Item (from sheet 2)	Source
1A, 3A, 3aA, 4A, 6A	Construction Drawings, prepared by SCS
5A, 9A	Application Report dated June 2, 1966
6C	USGS Map Delano (1969)

BY MFB DATE 6/12/78 SUBJECT Neifert Creek Dam SHEET 4 OF 6

CHKD. BY [signature] DATE 7/7/78 Hydrology / Hydraulics JOB No.

Estimate of Spillway Discharge

Principal Spillway

Riser - inside dimensions 2'6" x 7'6"
total weir length = 13'3"

Conduit - 30" dia. 271.4' Long concrete pipe
outlet invert 1063.0

$$Q = A_p \sqrt{\frac{2gH}{1 + K_e + K_p L_p}}$$

K_e = entrance loss - assume 0.4

K_p = pipe loss, assume $n = 0.012$,
$\therefore K_p = 0.00706$ NEH-5 ES-42

L_p = length of pipe
A_p = area of pipe

$$Q = 4.91 \sqrt{\frac{64.4}{1 + 0.4 + 0.00706 \cdot 271.4}}\ H^{1/2}$$

$$= 20.96\ H^{1/2}$$

Reservoir water level at 1113.5

$H = 1113.5 - (1063.0 + 0.4 \cdot 2.5)$
$= 49$ ft.

$Q = 147$ cfs ; therefore, value listed in application report is reasonable

Emergency Spillway

Crest - 1113.5 ft. Top of Dam - 1121.5
Width - 130 ft.

Maximum Head = 1121.5 - 1113.5 = 8 ft.

assume $n = 0.04$ given exit slope = 0.025

side slopes are 1/4 : 1 (H:V)
therefore assume rectangular section to determine critical depth

BY MEB DATE 6/12/78 SUBJECT Neifert Creek Dam Hydrology / Hydraulics SHEET 5 OF 6

CHKD. BY DATE 7/7/78 JOB No

Emergency Spillway (con't)

Critical Depth for Q = 9400 cfs (Application Report)

$$d_c = \sqrt[3]{\frac{q^2}{g}} \qquad q = \frac{Q}{b} = \frac{9400}{130} = 72.3$$

$$d_c = \sqrt[3]{\frac{72.3^2}{32.2}}$$

$$= 5.45 \text{ ft.}$$

Normal Depth d_n on Exit Slope

$$Q = \frac{K'}{n} b^{8/3} S^{1/2}$$ King & Brater Hydraulic Handbook

$$9400 = \frac{K'}{0.04} 130^{8/3} 0.025^{1/2}$$

$$K' = 0.0055$$

D/b	K'
0.03	0.00419
	0.0055
0.04	0.0067

$$D/b = 0.0352$$

$$D = d_n = 4.58 \text{ ft}$$

therefore flow down slope is supercritical and depth of flow at level section & exit slope is approximately d_c.

Losses in approach channel are assumed to be less than (8 - 5.45) 2.55 ft. and reported flow is reasonable.

BY MEB DATE 6/12/78 SUBJECT Neifert Creek Dam Hydrology / Hydraulics SHEET 6 OF 6

CHKD. BY DATE 7/7/78 JOB No.

Neifert Creek Dam Drainage Area = 3.1 sq. miles

Compare to Quakake Creek: estimated PMF peak inflow is 9620 cfs for 6.7 sq. miles

Q = Peak Inflow to Neifert Creek = $\left(\frac{3.1}{6.7}\right)^{0.8}$ 9620

Q = 5193 cfs

Say 5190 cfs

Estimated Peak Outflow > Peak Inflow from above

9400 cfs > 5190 cfs

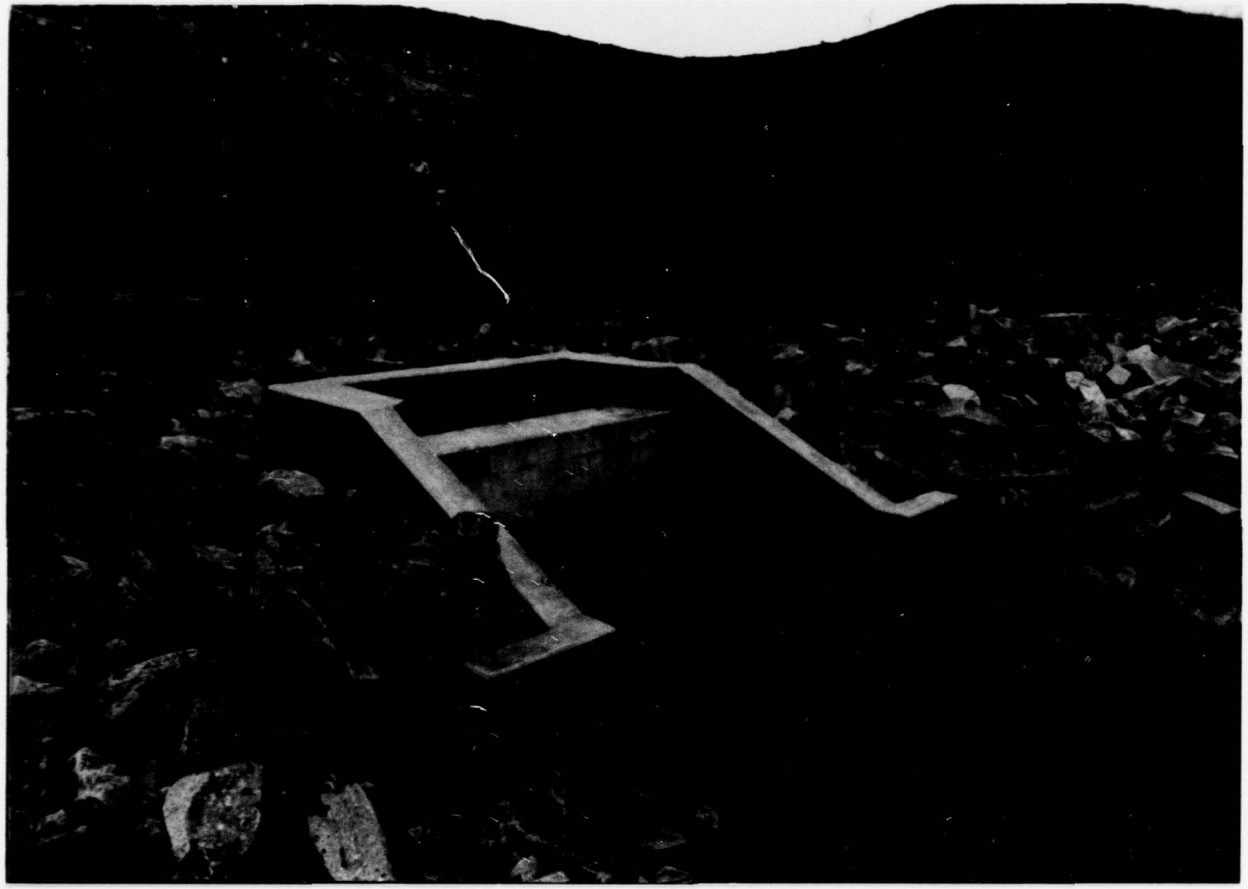
THEREFORE: SPILLWAY SYSTEM IS ADEQUATE

APPENDIX

D

VIEW OF INTAKE STRUCTURE.

PHOTO NO. 1



VIEW OF OUTFALL STRUCTURE. BAFFLE WALL IS SHOWN ON PHOTO IN FRONT OF OUTFALL PIPE.

PHOTO NO. 2

LOOKING ACROSS EMERGENCY SPILLWAY ALONG CONCRETE SILL. ONE SIDE HILL SEEP WAS NOTED UPSTREAM OF THE WALL NEAR THE LEFT ABUTMENT. SEEP IS LOCATED NEAR THE INSPECTOR.

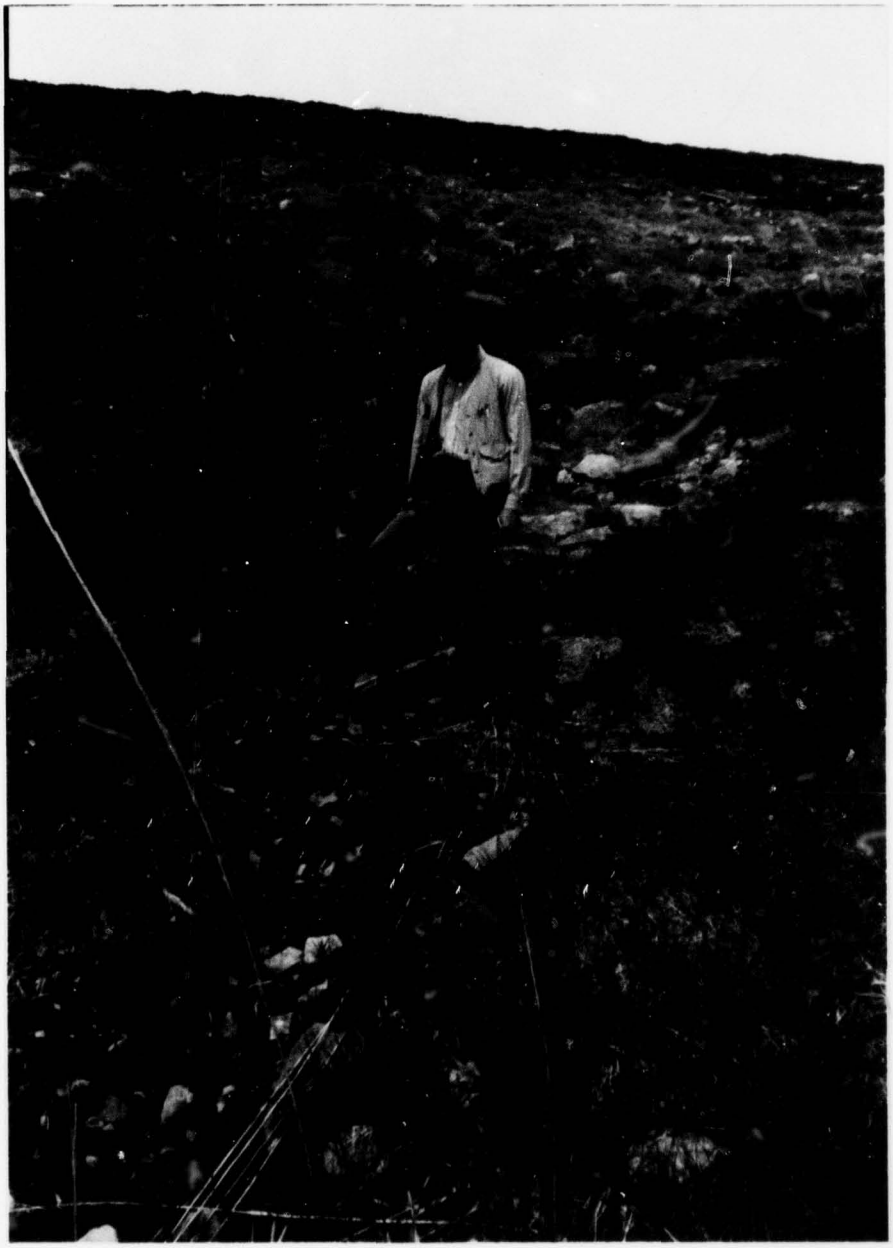
PHOTO NO. 3

VIEW LOOKING ALONG EMERGENCY SPILLWAY. THE DISCHARGE WOULD DRAIN INTO THE NATURAL STREAMBED AS SHOWN.

PHOTO NO. 4

VIEW OF CHANNEL DOWNSTREAM OF OUTFALL STRUCTURE.
EMERGENCY SPILLWAY IS LOCATED ON LEFT SIDE OF PHOTO.

PHOTO NO. 5

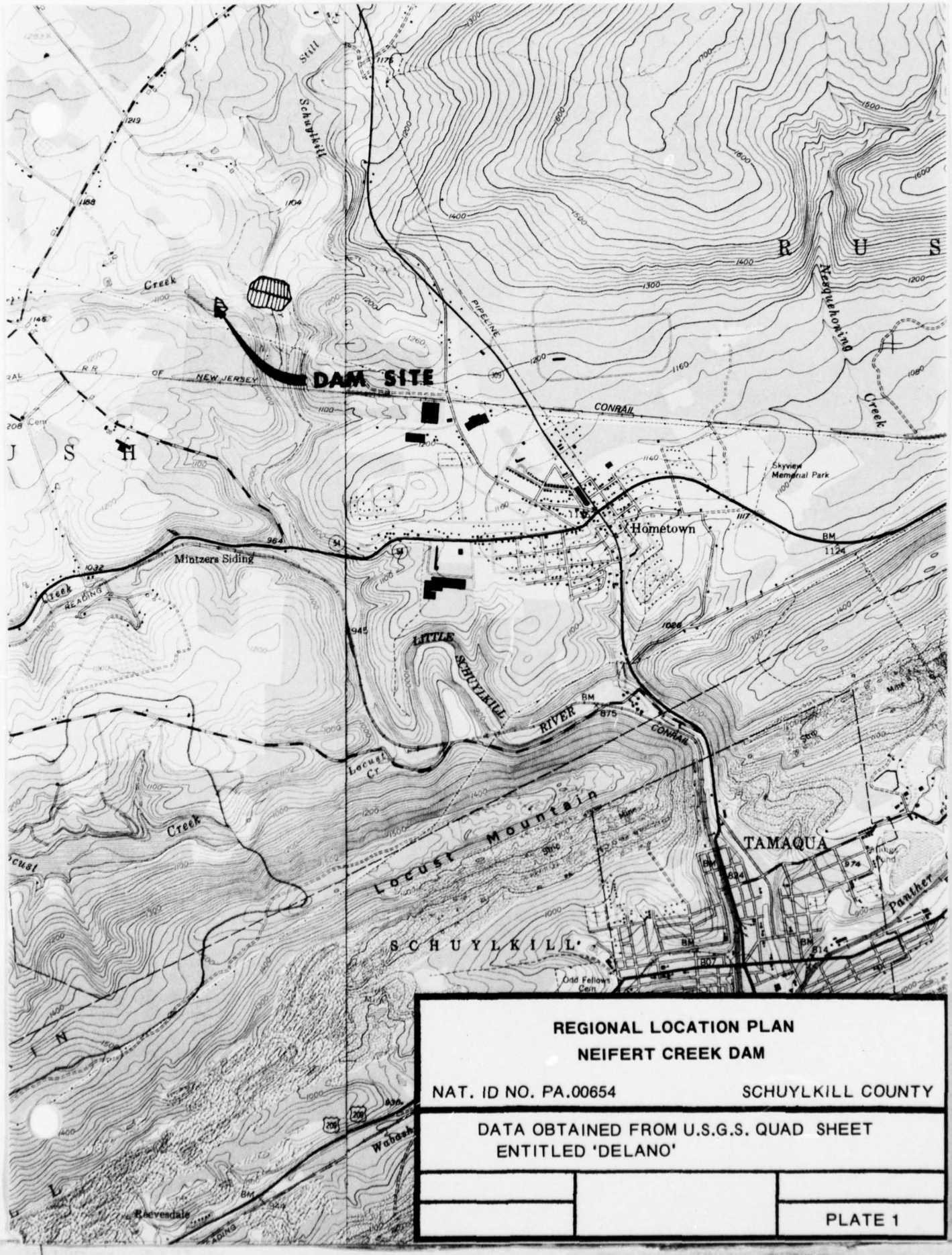


SEEPAGE OBSERVED AT THE JUNCTION OF THE DAM (LEFT) WITH THE NATURAL ABUTMENT (RIGHT). THE SEEP IS LOCATED APPROXIMATELY 20 FEET UPSLOPE OF THE OUTFALL STRUCTURE.

PHOTO NO. 6

APPENDIX

E

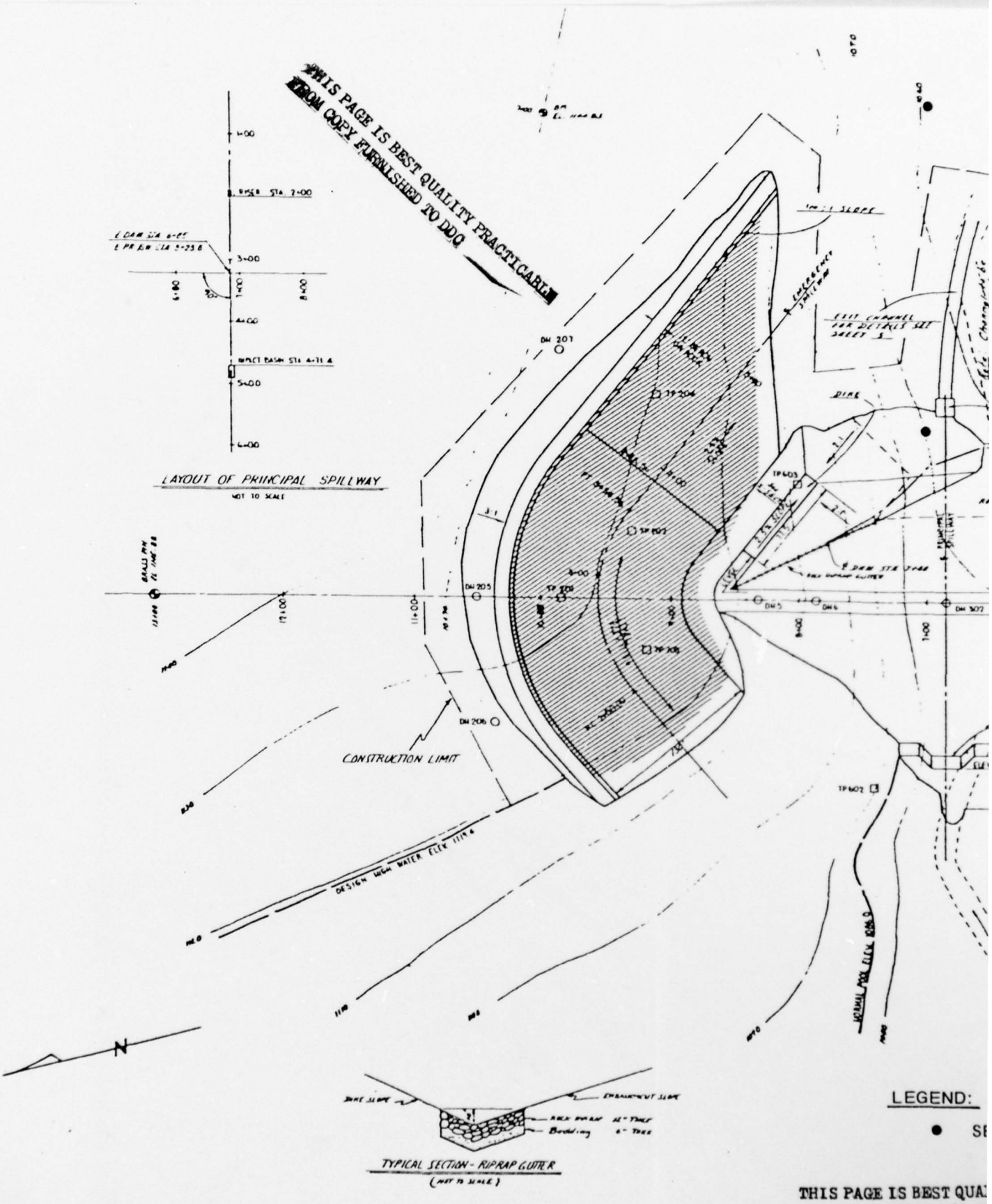


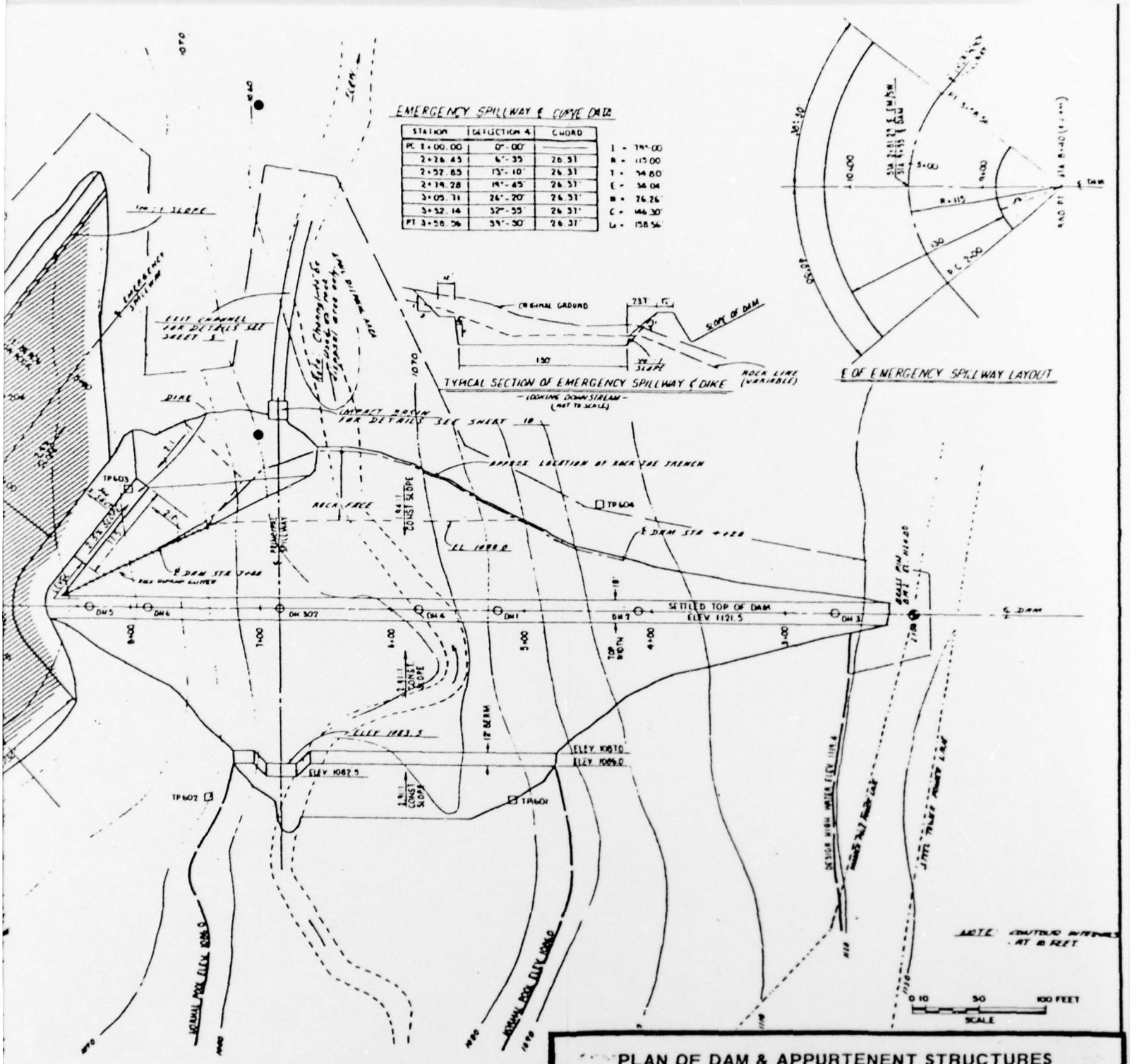
REGIONAL LOCATION PLAN
NEIFERT CREEK DAM

NAT. ID NO. PA.00654 SCHUYLKILL COUNTY

DATA OBTAINED FROM U.S.G.S. QUAD SHEET
ENTITLED 'DELANO'

PLATE 1





LEGEND:

● SEEPAGE LOCATION

PLAN OF DAM & APPURTENENT STRUCTURES
NEIFERT CREEK DAM

NAT. ID NO. PA. 00654 SCHUYLKILL COUNTY

DATA OBTAINED FROM U.S.DEPT. OF AGRICULTURE, SOIL CONSERVATION SERVICE, SHEET 3 OF 15, DRAWING NO. PA-422A-P, DATED APRIL 1966

PLATE 2

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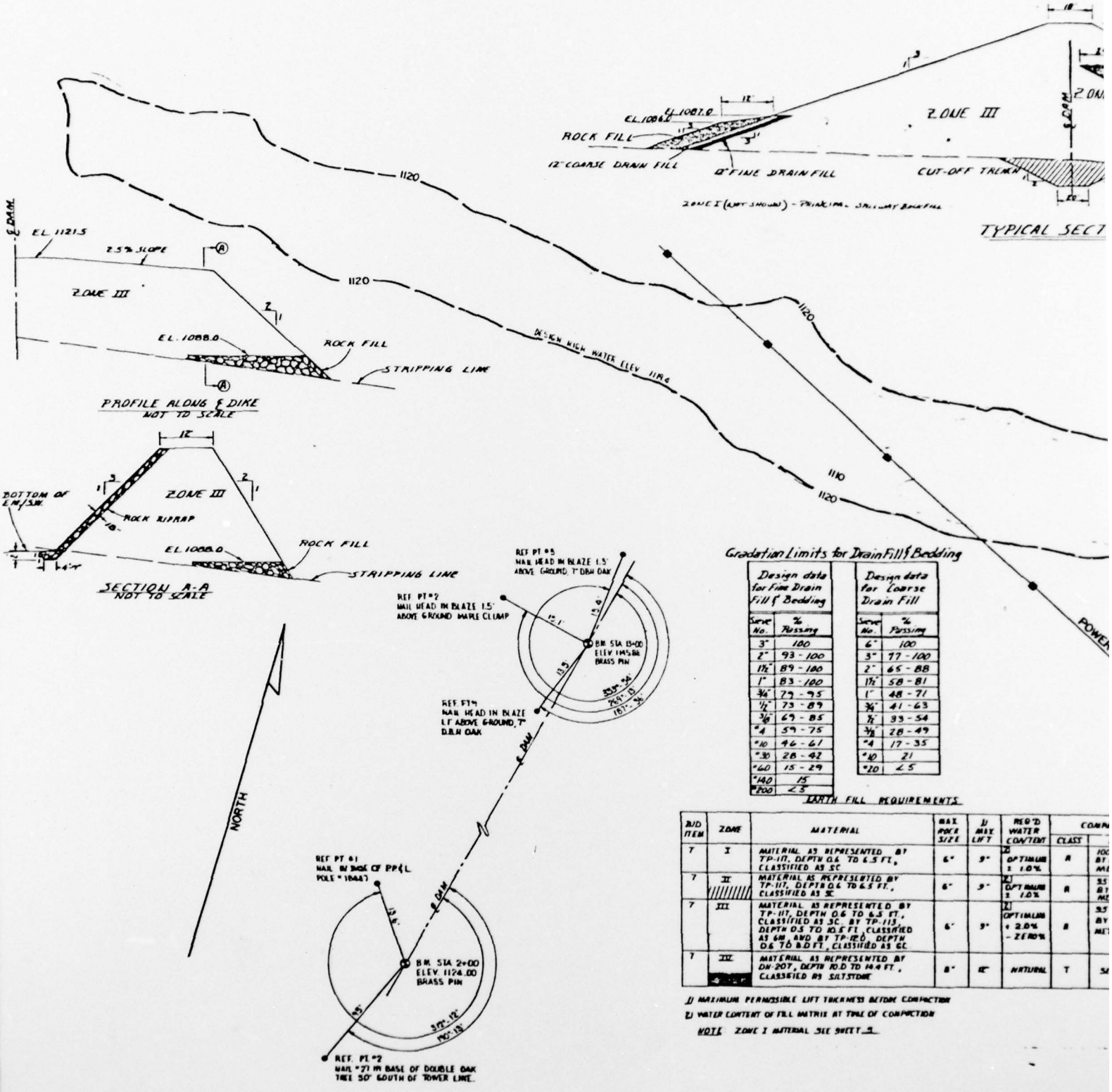

Gradation Limits for Drain Fill & Bedding

Design data for Fine Drain Fill & Bedding	
Sieve No.	% Passing
3"	100
2"	93 - 100
1½"	89 - 100
1"	83 - 100
¾"	79 - 95
½"	73 - 89
⅜"	69 - 85
#4	59 - 75
#10	46 - 61
#30	28 - 42
#60	15 - 29
#140	15
#200	< 3

Design data for Coarse Drain Fill	
Sieve No.	% Passing
6"	100
3"	77 - 100
2"	65 - 88
1½"	58 - 81
1"	48 - 71
¾"	41 - 63
½"	33 - 54
⅜"	28 - 49
#4	17 - 35
#10	21
#20	< 5

EARTH FILL REQUIREMENTS

BID ITEM	ZONE	MATERIAL	MAX ROCK SIZE	[1] MAX LIFT	REQ'D WATER CONTENT	COMPA CLASS	COMPA
7	I	MATERIAL AS REPRESENTED BY TP-117, DEPTH 0.6 TO 6.5 FT., CLASSIFIED AS SC	6"	9"	[2] OPTIMUM ± 1.0%	A	100 BY ME
7	II	MATERIAL AS REPRESENTED BY TP-117, DEPTH 0.6 TO 6.5 FT., CLASSIFIED AS SC	6"	9"	[2] OPTIMUM ± 1.0%	A	95 BY ME
7	III	MATERIAL AS REPRESENTED BY TP-117, DEPTH 0.6 TO 6.5 FT., CLASSIFIED AS SC, BY TP-113, DEPTH 0.5 TO 10.5 FT. CLASSIFIED AS GM, AND BY TP-120, DEPTH 0.6 TO 8.0 FT., CLASSIFIED AS GC	6"	9"	[2] OPTIMUM + 2.0% - ZERO%	B	95 BY ME
7	III	MATERIAL AS REPRESENTED BY DH-207, DEPTH 10.0 TO 14.4 FT., CLASSIFIED AS SILTSTONE	8"	12"	NATURAL	T	95

[1] MAXIMUM PERMISSIBLE LIFT THICKNESS BEFORE COMPACTION

[2] WATER CONTENT OF FILL MATRIX AT TIME OF COMPACTION

NOTE: ZONE I MATERIAL SEE SHEET 5

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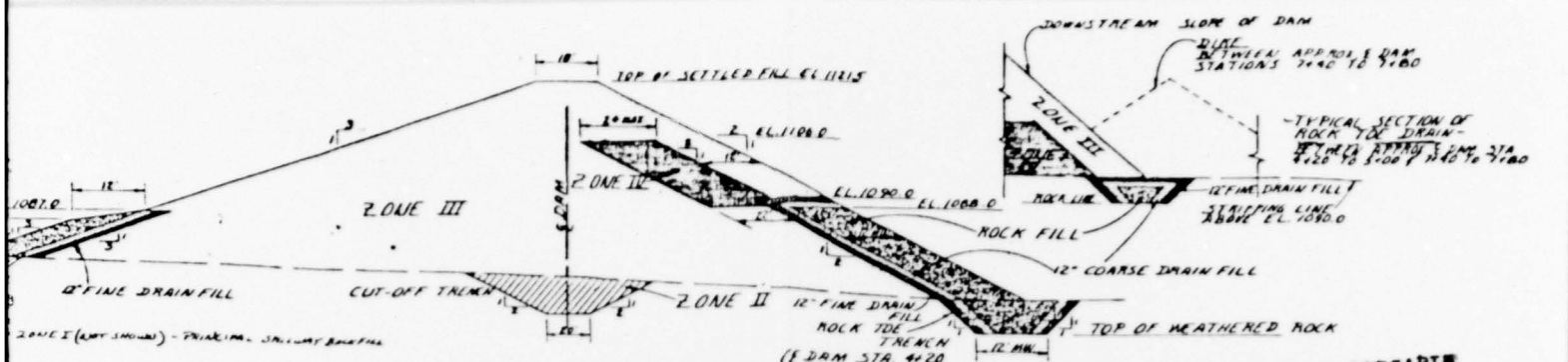

TYPICAL SECTION OF DAM

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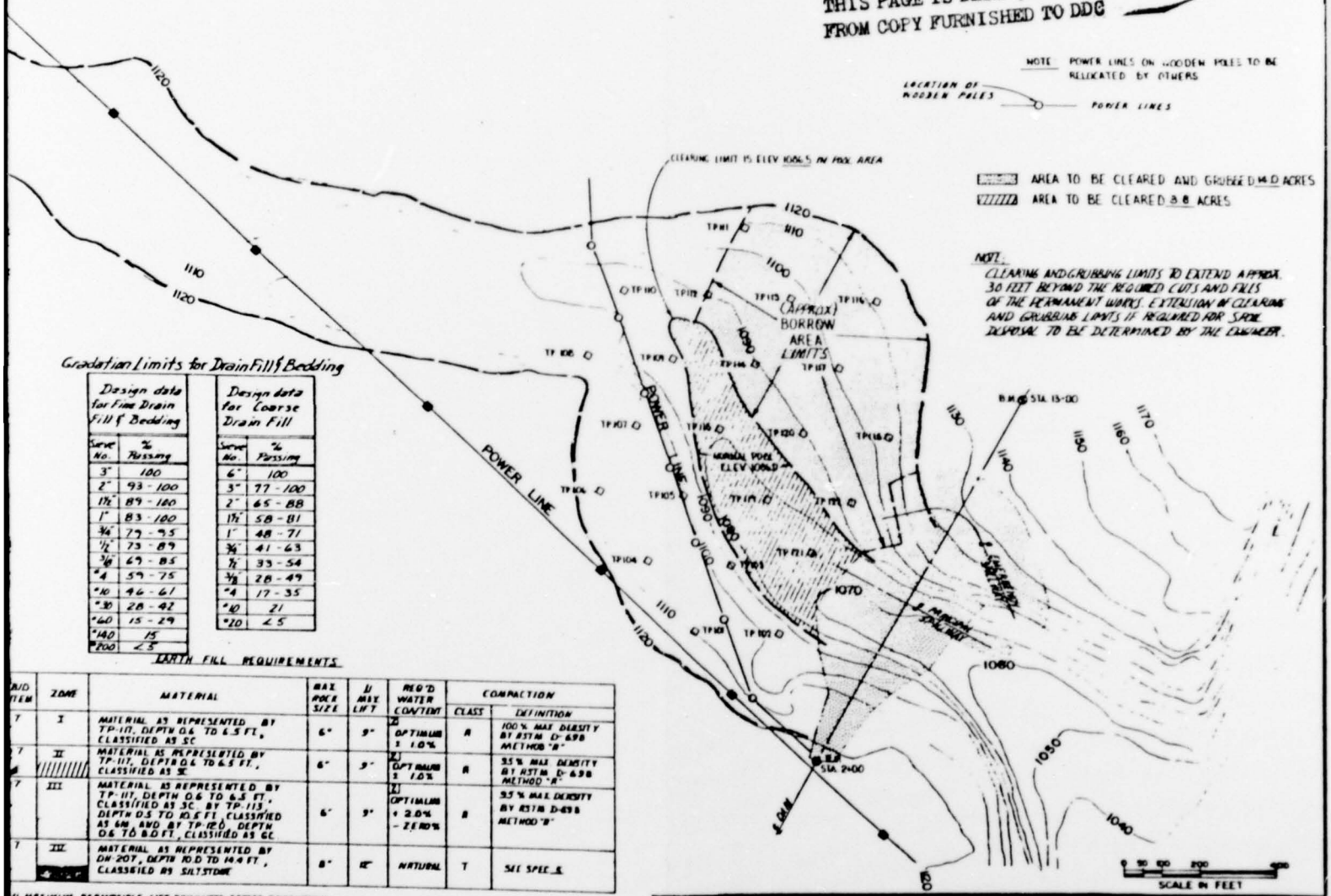

Gradation Limits for Drain Fill & Bedding

Design data for Fine Drain Fill & Bedding	
Sieve No.	% Passing
3"	100
2"	93 - 100
1½"	89 - 100
1"	83 - 100
¾"	79 - 95
½"	73 - 89
⅜"	69 - 85
#4	59 - 75
#10	46 - 61
#30	28 - 42
#60	15 - 29
#140	15
#200	2.3

Design data for Coarse Drain Fill	
Sieve No.	% Passing
6"	100
3"	77 - 100
2"	65 - 88
1½"	58 - 81
1"	48 - 71
¾"	41 - 63
½"	33 - 54
⅜"	28 - 49
#4	17 - 35
#40	2.1
#200	2.5

EARTH FILL REQUIREMENTS

ZONE	MATERIAL	MAX ROCK SIZE	[1] MAX LIFT	REQ'D WATER CONTENT	COMPACTION CLASS	COMPACTION DEFINITION
I	MATERIAL AS REPRESENTED BY TP-117, DEPTH 0.6 TO 6.5 FT., CLASSIFIED AS SC	6"	9"	[2] OPTIMUM ± 1.0%	A	100% MAX. DENSITY BY ASTM D-698 METHOD "B"
II	MATERIAL AS REPRESENTED BY TP-117, DEPTH 0.6 TO 6.5 FT., CLASSIFIED AS SC	6"	9"	[2] OPTIMUM ± 1.0%	A	95% MAX. DENSITY BY ASTM D-698 METHOD "A"
III	MATERIAL AS REPRESENTED BY TP-117, DEPTH 0.6 TO 6.5 FT., CLASSIFIED AS SM AND BY TP-113 DEPTH 0.5 TO 10.5 FT. CLASSIFIED AS SM, AND BY TP-120, DEPTH 0.6 TO 8.0 FT., CLASSIFIED AS GC	6"	9"	[2] OPTIMUM + 2.0% - 2.5 [3]	B	95% MAX. DENSITY BY ASTM D-698 METHOD "B"
III	MATERIAL AS REPRESENTED BY DH 207, DEPTH 10.0 TO 14.4 FT., CLASSIFIED AS SILTSTONE	8"	12"	NATURAL	T	SEE SPEC. 5

[1] MAXIMUM PERMISSIBLE LIFT THICKNESS BEFORE COMPACTION
[2] WATER CONTENT OF FILL MATRIX AT TIME OF COMPACTION
NOTE ZONE I MATERIAL SEE SHEET 5

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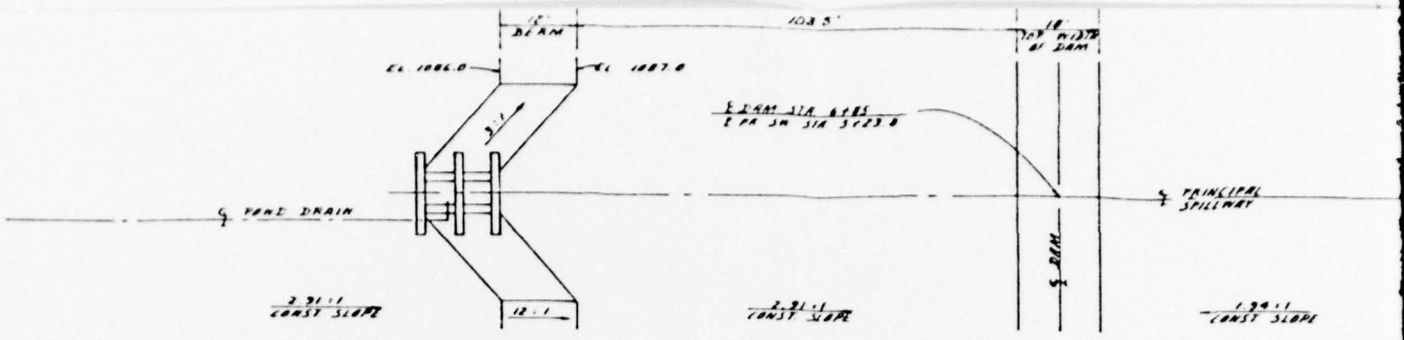
PLAN OF RESERVIOR & TYPICAL DAM SECTION
NEIFERT CREEK DAM

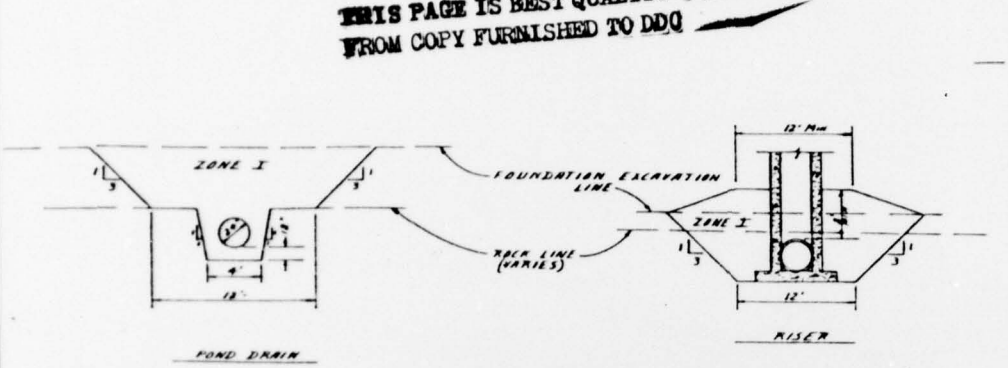
NAT. ID NO. PA.00654 SCHUYLKILL COUNTY

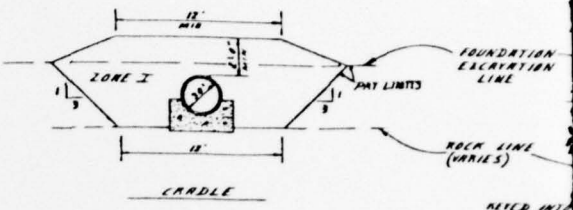
DATA OBTAINED FROM U.S. DEPT. OF AGRICULTURE, SOIL CONSERVATION SERVICE, SHEET 2 OF 15, DRAWING NO. PA-422A-P, DATED APRIL 1966

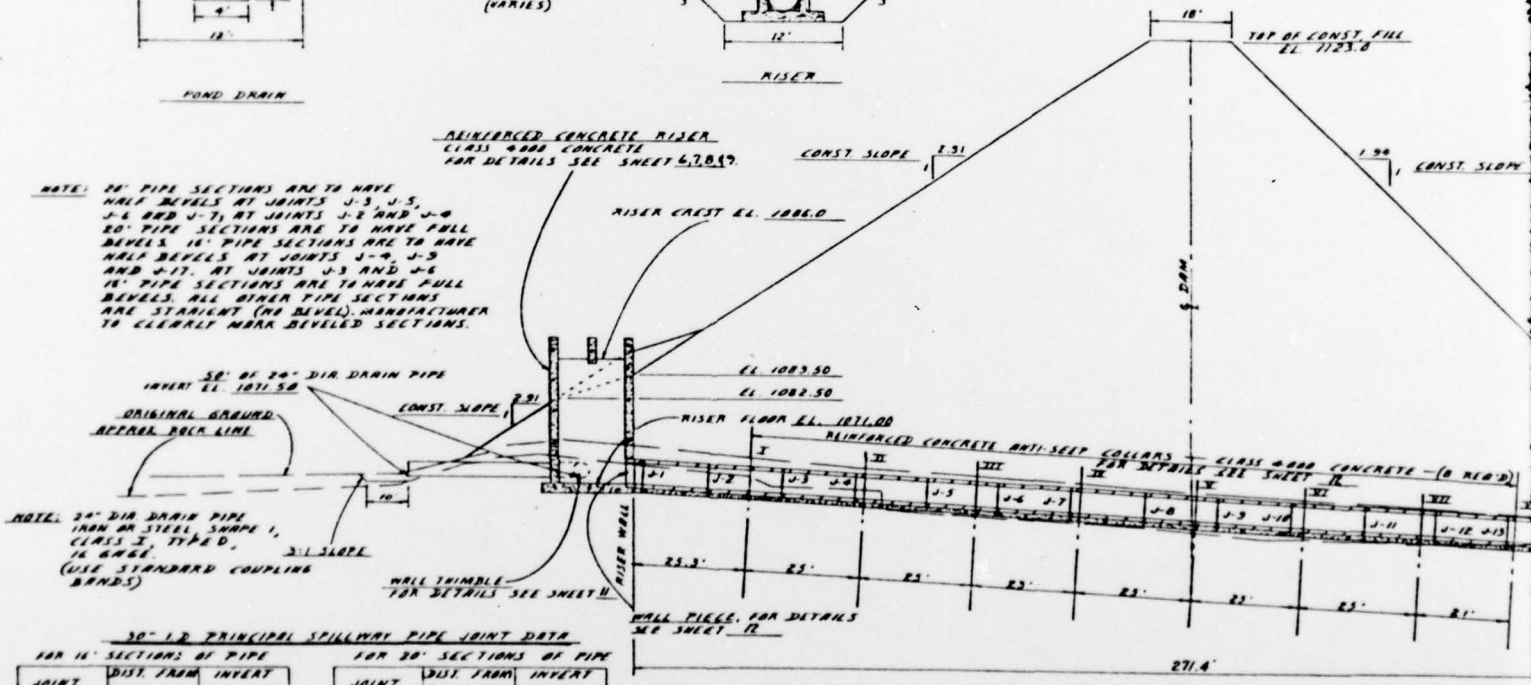
PLATE 3



PLAN VIEW







PROFILE ALONG ℄ OF PRINCIPAL SPILLWAY

30" I.D. PRINCIPAL SPILLWAY PIPE JOINT DATA

FOR 16' SECTIONS OF PIPE

JOINT	DIST. FROM RISER WALL	INVERT ELEVATION
J-1	0.3'	1071.00
J-2	16.3'	1071.00
J-3	32.3'	1071.00
J-4	48.3'	1069.50
J-5	64.3'	1068.00
J-6	80.3'	1066.20
J-7	96.3'	1065.55
J-8	112.3'	1064.80
J-9	128.3'	1064.80
J-10	144.3'	1063.80
J-11	160.3'	1063.70
J-12	176.3'	1063.60
J-13	192.3'	1063.60
J-14	208.3'	1063.60
J-15	224.3'	1063.60
J-16	240.3'	1063.60
J-17	256.3'	1063.60
OUTLET	272.3'	1063.00

FOR 20' SECTIONS OF PIPE

JOINT	DIST. FROM RISER WALL	INVERT ELEVATION
J-1	0.3'	1071.00
J-2	20.3'	1071.00
J-3	40.3'	1069.50
J-4	60.3'	1068.75
J-5	80.3'	1066.50
J-6	100.3'	1065.00
J-7	120.3'	1064.25
J-8	140.3'	1064.25
J-9	160.3'	1064.25
J-10	180.3'	1064.25
J-11	200.3'	1064.15
J-12	220.3'	1063.95
J-13	240.3'	1063.70
J-14	260.3'	1063.40
OUTLET	280.3'	1063.00

PRINCIPAL SPILLWAY ANTI-SEEP COLLAR DATA

FOR 16' SECTIONS OF PIPE

COLLAR	DIST FROM RISER WALL	INVERT ELEVATION
I	25.3'	1071.00
II	50.3'	1069.58
III	75.3'	1066.76
IV	98.3'	1065.96
V	123.3'	1064.25
VI	148.3'	1063.78
VII	173.3'	1063.62
VIII	198.3'	1063.60

FOR 20' SECTIONS OF PIPE

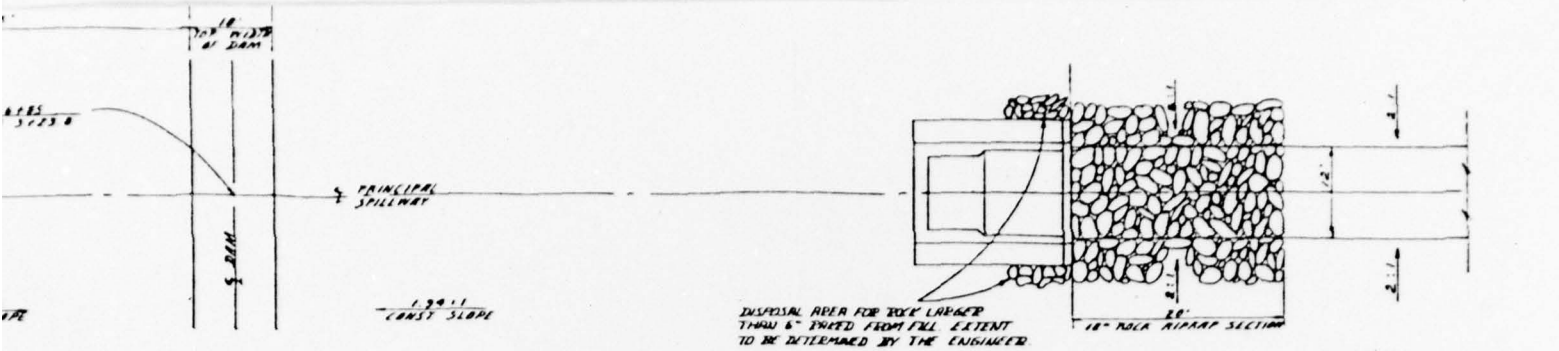
COLLAR	DIST FROM RISER WALL	INVERT ELEVATION
I	25.3'	1070.63
II	50.3'	1069.13
III	75.3'	1067.06
IV	98.3'	1065.15
V	123.3'	1064.25
VI	148.3'	1064.25
VII	173.3'	1064.25
VIII	198.3'	1063.18

30" INSIDE DIA REINFORC
8 20' STRAIGHT SECTI
2 20' FULL BEVEL SECT
4 20' HALF BEVEL SEC
1 WALL PIECE (FOR R

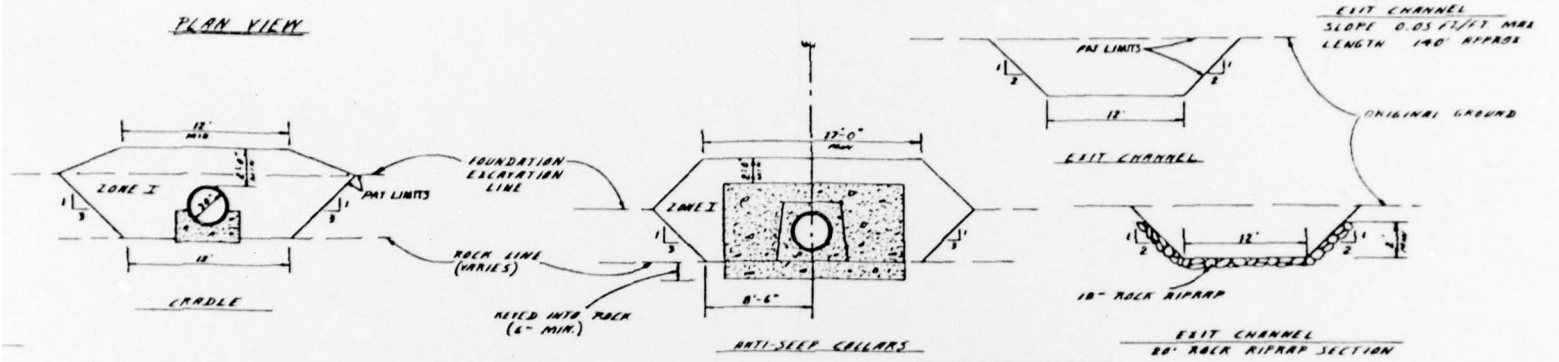
PRESSURE HEAD = 42'
LOAD = 67,000 LBS. PER
MIN. 3 EDGE BEARING
0.01" CRACK WIDT
0.001" CRACK PAT

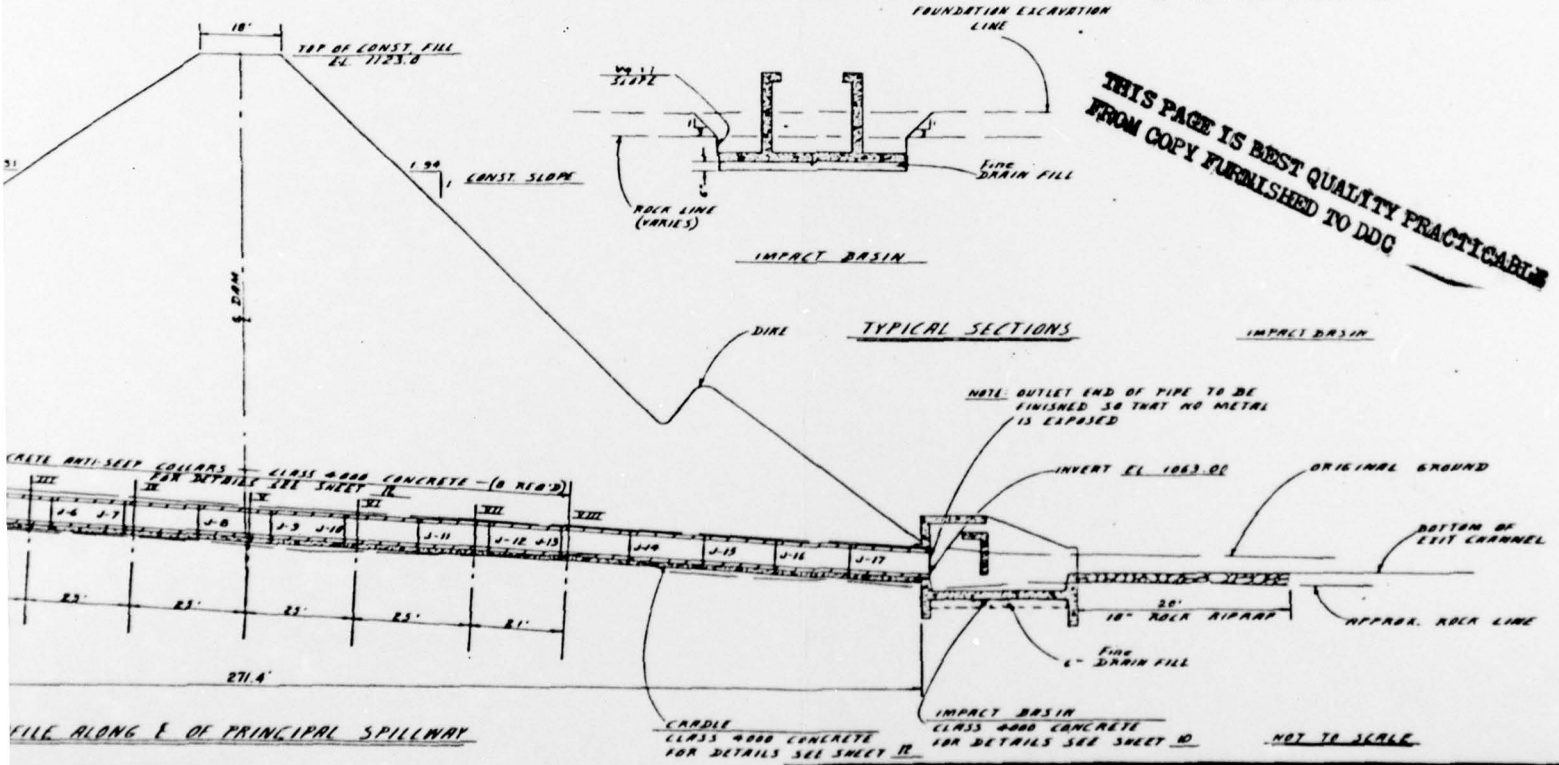
TOTAL L

NOTE: PLAN AND
ARE BASED



PLAN VIEW





FILL ALONG ℄ OF PRINCIPAL SPILLWAY

NOT TO SCALE

ANTI-SEEP COLLAR DATA
FOR 20' SECTIONS OF PIPE

COLLAR	DIST FROM RISER WALL	INVERT ELEVATION
I	25.3'	1070.63
II	50.3'	1069.13
III	75.3'	1067.06
IV	98.3'	1065.15
V	123.3'	1064.25
VI	148.3'	1064.25
VII	173.3'	1064.25
VIII	196.3'	1064.18

30" INSIDE DIA REINFORCED CONCRETE PRESSUR

6	20' STRAIGHT SECTIONS		12
2	20' FULL BEVEL SECTIONS		2
4	20' HALF BEVEL SECTIONS	OR	3
1	WALL PIECE (FOR 18" WALL)		1

PRESSURE HEAD = 60'
LOAD = 67,800 LBS. PER LIN. FT.; BASED ON
MIN 3 EDGE BEARING STRENGTH FOR:
0.01" CRACK NON-PRESTRESSED PIPE
0.001" CRACK PRESTRESSED PIPE = 1

TOTAL LENGTH 200.3' FOR
272.3' FOR

NOTE: PLAN AND PROFILE FOR PRINCI
ARE BASED ON DATA FOR N' S

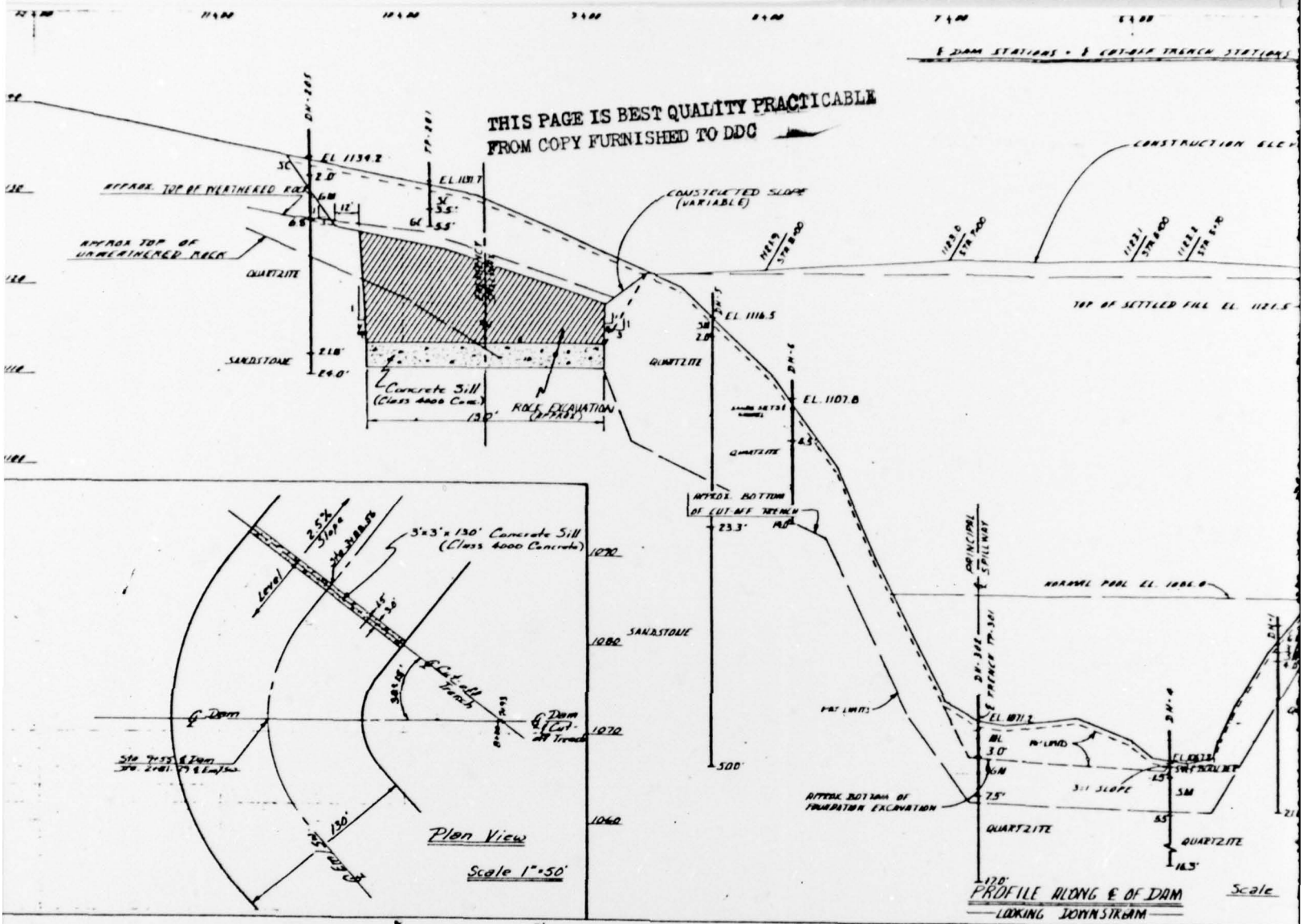
PRINCIPAL SPILLWAY
NEIFERT CREEK DAM

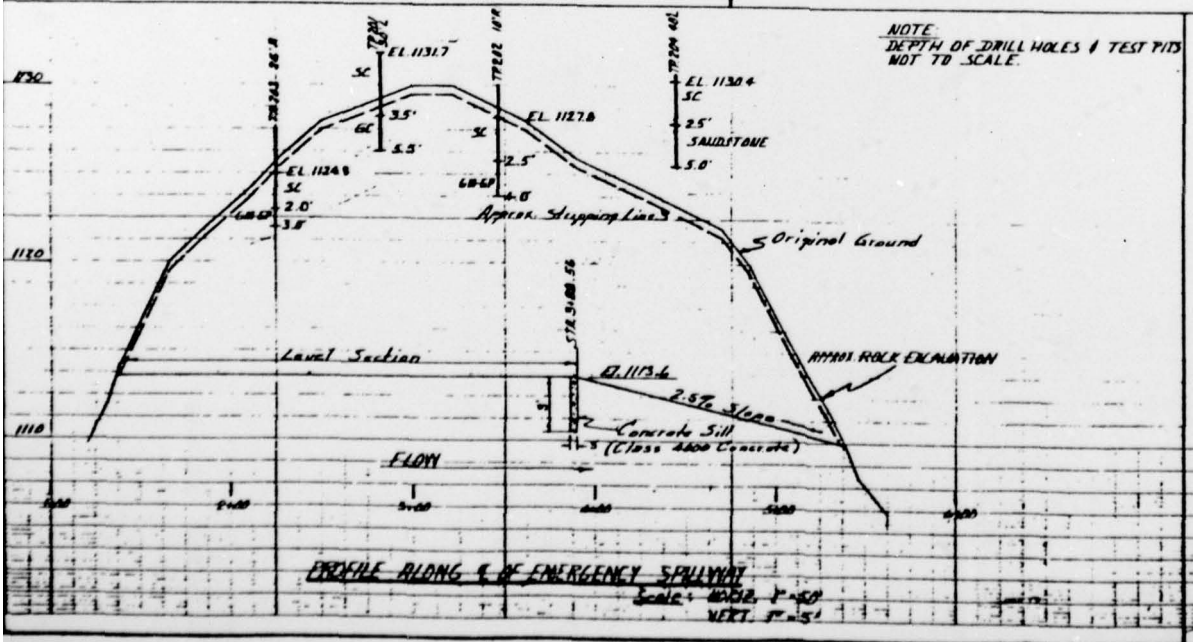
NAT. ID NO. PA. PA.00654 SCHUYLKILL COUNTY

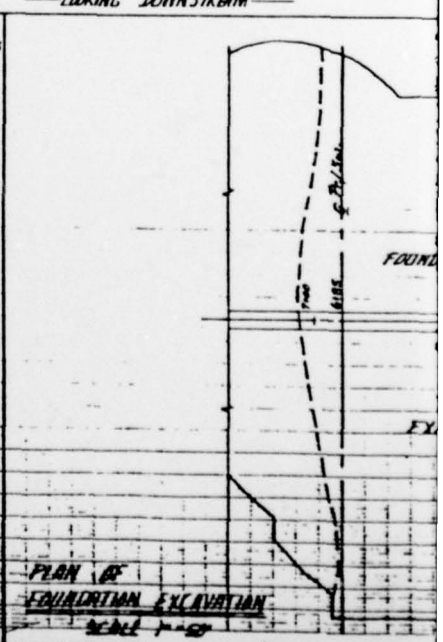
DATA OBTAINED FROM U.S. DEPT. OF AGRICULTURE, SOIL CONSERVATION SERVICE, SHEET 5 OF 15, DRAWING NO. PA-422A-P, DATED APRIL 1966

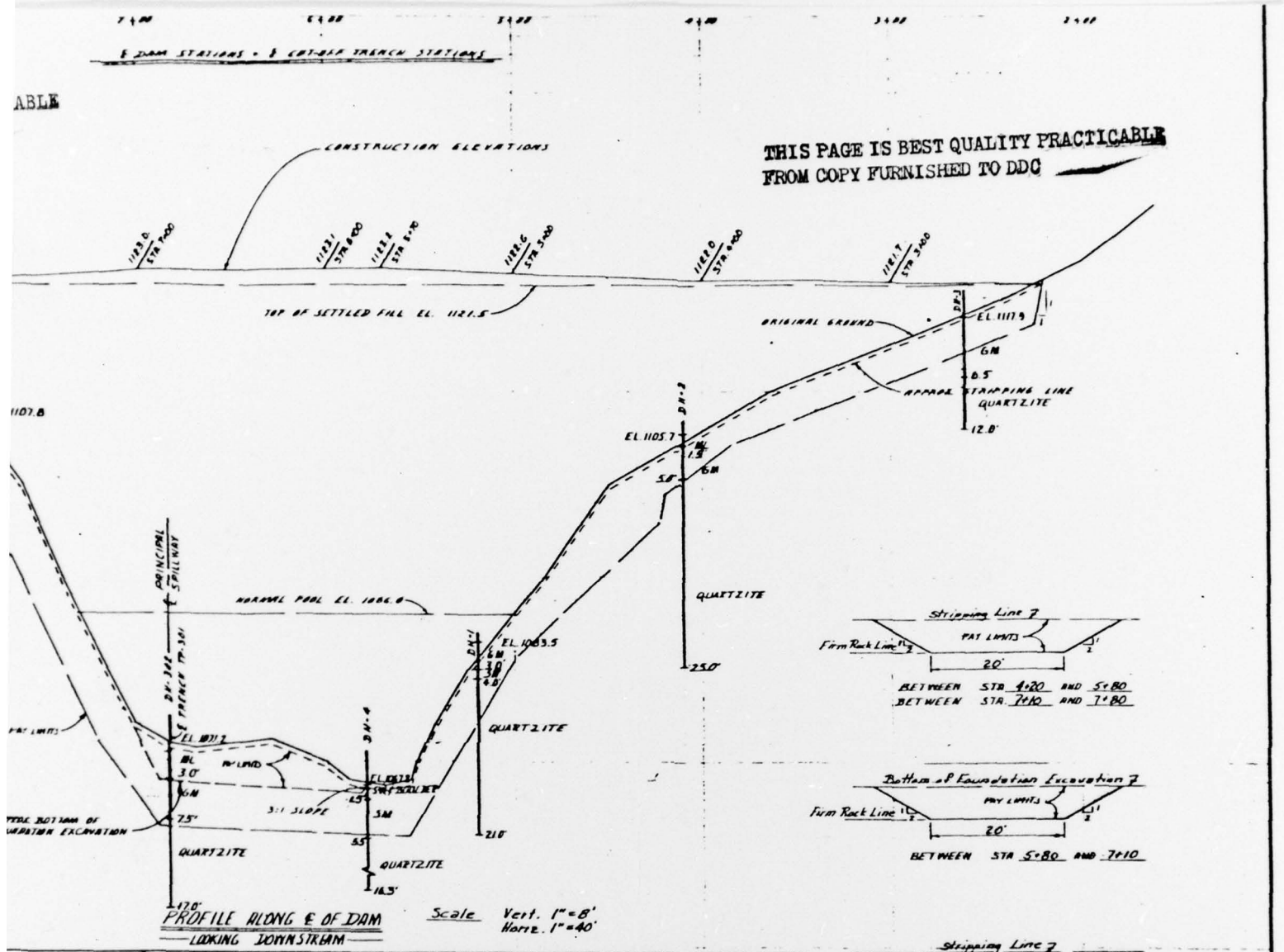
2

PLATE 4









PROFILE ALONG ℄ OF DAM
LOOKING DOWNSTREAM

Scale Vert. 1"=8'
Horiz. 1"=40'

TYPICAL SECTIONS OF CUT-OFF TRENCH

FOR LOGS OF DRILL HOLES AND TEST PITS
SEE SHEETS 13, 14, 15

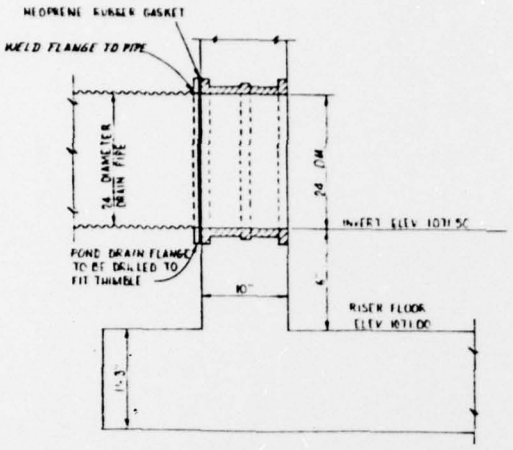
EMERGENCY SPILLWAY
NEIFERT CREEK DAM

NAT. ID NO. PA.00654 SCHUYLKILL COUNTY

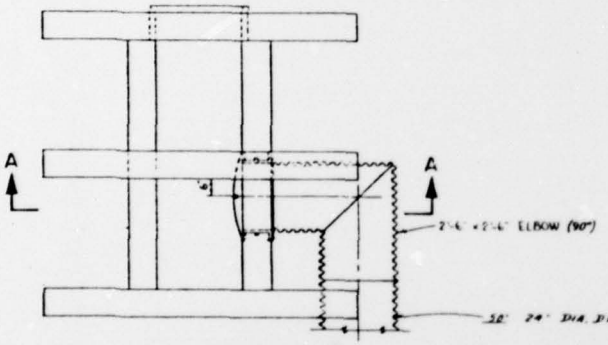
DATA OBTAINED FROM U.S.DEPT. OF AGRICULTURE, SOIL CONSERVATION SERVICE, SHEET 4 OF 15, DRAWING NO. PA-422A-P, DATED APRIL 1966

2

PLATE 5



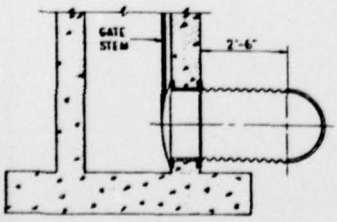
POND DRAIN GATE THIMBLE



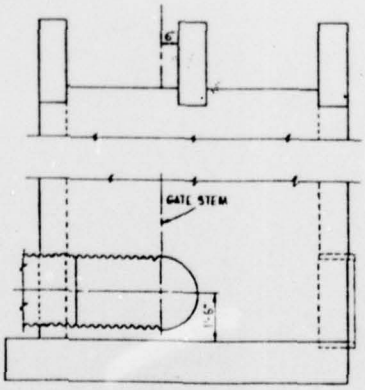
TOP PLAN

SLIDE GATE NOTES

1. SLIDE GATE - 24" DIA. FLANGE BACK, S-20, SELF-CONTAINED (WEIGHT OF GATE DURING RAISING AND LOWERING TAKEN BY THE GATE FRAME.)
2. 10" DEEP, TYPE "E" WALL THIMBLE, ROUND OPENING, ROUND FLANGE, DRILLED AND TAPPED TO FIT GATE FRAME AND POND DRAIN FLANGE
3. NON-RISING STEM - THREADED PORTION BRONZE
4. FULLY ADJUSTABLE STEM GUIDES
5. STEM, STEM GUIDES, AND LIFTING DEVICE SIZED AND SPACED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.



SECTION A-A



SIDE ELEVATION

POND DRAIN OUTLET DETAILS

20 SELF-CONTAINED
LOWERING TAKEN BY

OPENING, ROUND
E FRAME AND POND

SKONZE

E SIZED AND SPACED
NDATIONS

POND DRAIN SECTIONS
NEIFERT CREEK DAM

NAT. ID NO. PA.00654 SCHUYLKILL COUNTY

DATA OBTAINED FROM U.S.DEPT. OF AGRICULTURE, SOIL CONSERVATION SERVICE, SHEET 11 OF 15, DRAWING NO. PA-422A-P, DATED APRIL 1966

PLATE 6

SCS-313C (9-64)

2

[illegible]
Logged by: H. Marien 1?/2?/65
Drilling Equipment: Acker TH ? (11b) [illegible]

Hole From	Depth To	Description of Material	Unif. Soil Class Symb.	STANDARD PENETRATION Blows Per 6"	Type Bit Used	No.	SAMPLES From Ft.	To Ft.	% Rec.
0.	0.4	Forest litter, topsoil, t..		?-2-2	SpT		0.0	1.5	[illegible]
0.4	?.?	Gravel, sandy and silty,	[illegible]	?-?-?	"	2	1.5	?.0	[illegible]
		brownish, red, moist, ?%.		??-?7	"	[illegible]	?.0	?.0	[illegible]
		low plastic fine, 2?%.			NX		?.?	5.?	8
		poorly graded sand, w			"		?.0	?.?	10
		graded, subangular gravel			"	6	?.?	12.?	100
		which is weathered quart-			"	7	12.0	16.?	10?
		zite. Coarse grained.			"	?	16.?	2?.0	100
?	?.0	Quartzite, weathered, red moist, ?% well graded sand trace of gravel and silt.	SW						
?	8.9	Quartzite, unweathered, coarse to med. grained, grn with red-brn and white, slight indications of bedding in places, pieces from 0.1' to 1.?' long were recovered, breaks occurred along bedding, broken zone at ?.?'-?.6' solution cavity (quartz) at ?.?', (quartzite is very compact and breaks are probably due to using ? tube) particle within quartzite range from ?.?' to very fine sand and are well graded. Sorting has occurred in some places very durable.							
8.9	1?.8	Quartzite, med. to fine grained, grn and white, crossbedding and bedding apparent, beds are from ?.25' to ?.01' in thickness, generally becomes finer and thinner with depth, pieces from ?.?'-?.0' long recovered, one solution vien 0.?1' thick at 1?.5', several fractures with evidence of staining, both fractures and breaks occurred either along bedding planes or at angles of 2? degrees with side of core, not weathered, compact, very durable, no gravel size particles, less than ?% coarse sand, occasional sorted beds, hardness of 6 - apparent dip - 22 degrees.							
13.8	14.6	Quartzite, coarse to very coarse grained, conglomerate ?.01' solution vein, staining along beds, fracture at 2? degree angle to side of core, pieces from ?.?5'-?.?' long, grn, brn-red and white, all breaks stained, about ?% coarse particles, no voids apparent.							
14.6	21.?	Quartzite, med. to fine grained, grn and white with some brn-red. Cross-bedding and bedding apparent, beds from ?.2-?.0?', pieces from 0.1'-?.?' from 14.6' to 1?.5', fractured and broken at angle less than ?0 degrees, red staining along breaks and fractures, trace of gravel size particles WL (10/22/65) 1?.?'							

Note: Samples ? through ? Jar type.

DH 2, ELEV. 1135.7, ?+10, Centerline
Logged by: H. Marien 10/2?/65
Drilling Equipment: Acker TH?

Hole From	Depth To	Description of Materials	Unif. Soil Class Symb.	STANDARD PENETRATION Blows Per 6"	Type Bit Used	No.	SAMPLES From Ft.	To Ft.	% Rec.
0.0	0.3	Forest litter, roots, etc.		1-3-?	SpT	1	0.0	1.?	??
0.?	1.5	Silt, sandy, brownish-red	ML	7-11-13	"	2	1.?	3.0	??
		moist, root, hairs, trace		22-3?-51	"	3	?.?	?.5	70
		of gravel, 15% well graded		87	"	?	?.?	5.0	60
		sand, (from bedrock)			Dia.		5.?	1?.0	70
1.5	5.0	Gravel, sandy and silty,	G?		"		1?.0	14.1	10?
		brownish-red, moist, weathered			"		14.1	18.2	100
		quartzite, trace of cobbles,			"		18.2	20.?	100
		25% sand, 2?% low to med.			"		2?.?	25.0	?2
		plastic fines, 55% gravel.							
5.0	7.?	Quartzite, weathered and broken, reddish-gry, pieces from 0.05' to 0.2' recovered, no definite fracture planes.							
7.0	13.5	Quartzite, med. grained, approximately 10% coarse grained, slight crossbedding, grn to white and red, 0.05' thick quartz solution vein at 9.2'-1?.5' at 15 degrees to core, 30% voids, another vien 0.01' thick from 11.2-12.4' at 15 degree angle to core, 30% void space, pieces vary from 0.1' to 0.8' in length being broken either at right angles or at 30% to core, some staining of fractures hardness of 6.							
13.5	15.9	Quartzite conglomerate, red to white and grn, broken into 0.05' to 0.?' pieces, badly broken ?.3' zone at 15.4', some voids left unfilled (packing poor), sorted hardness of approximately 6.							
15.9	24.5	Quartzite, med. to fine grained, crossbedded, grn to white (a little red), pieces 0.2' to 2.0' long, fractured zone 22.5 to 23.0', some staining of fractures, fractures mostly horizontal, apparent dip 27 degrees, crossbedded at 45 degrees.							
24.5	25.0	Quartzite conglomerate, red to white with grn, one break at 30 degrees to core, tight packed, durable. WL (10/25/65) 9.7'							

Note: Samples 1 through ? jar type.

DH 3, ELEV. 1117.9, 2+61, Centerline
Logged by: H. Marien 10/25/65
Drilling Equipment: Acker TH?

Hole From	Depth To	Description of Materials	Unif. Soil Class Symb.	STANDARD PENETRATION Blows Per 6"	Type Bit Used	No.	SAMPLES From Ft.	To Ft.	% Rec.
0.0	0.5	Forest litter, roots, etc.		3-2-3	SpT	1	0.0	1.5	70
0.5	4.5	Gravel, sandy & silty,	GM	3-1-3	"	2	1.5	3.0	20
		brownish red, moist, 25%		13-21-20	"	3	3.0	4.5	15
		low to Med. plastic fines,		25-40-50	"	4	4.5	6.0	70
		25% well graded sand,		75	"	5	6.0	6.5	40
		50% gravel composed of			Dia.		6.5	8.0	93
		sandstone and siltstone,			"		8.0	9.9	84
		subangular impervious,			"		9.9	12.0	100
		trace of cobbles.							
4.5	6.5	Gravel, silty and sandy, brownish red, moist, 2?% low plastic fines, 15% sand, 65% subangular to angular gravel, composed of red silt-stone, and quartzite and siltstone	GM						

Note: Samples 1 through 5 jar type

Continued

DH 3 Cont'd

Hole From	Depth To	Description of Materials
6.5	7.0	Quartzite, med. grained, well graded, tan to white, vague bedding, 0.5' lo[ng]
7.0	10.8	Quartzite, med. to fine grained, red, to greyish red, vague bedding, 0.1' [illegible] stone at 9.2', badly broken and weathered near top, unweathered below 8.?', well graded, breaks into pieces ?.?5 to 0.5' in length. Along bedding, si[lt]
10.8	11.?	Sandstone, coarse grained, sorted, bedded, gry with some red, porous, oran[ge] 0.1' to ?.5' long.
11.6	12.	Quartzite, med. to fine grained, reddish brn, grades into tan at 12.0', be[dded] long, dk. brn-blk, staining, broken along bedding.

DH 4, ELEV. 1057.2?, Centerline, 5+79?
Logged by: ?. ?. Marien 1?/28/65
Drilling Equipment: Acker ?

Hole From	Depth To	Description of Materials	Unif. Soil Class Symb.	STANDARD PENETRATION Blows Per 6"	Type Bit Used	No.	Ty[pe]
0.0	1.?	Sand with gravel, brn, wet, trace fines trace of cobbles, 20% gravel.	SW	9-?1	SpT	1	Jar
1.0	1.5	Boulder, had to core.		7-7-8	SpT	2	"
1.5	5.5	Sand with silt and gravel, brn, wet, 15% low plastic fines, 15% well graded gravel, trace of cobbles, sand is well graded, med. to fine.	SM	39-30-26	"	3	"
				47-79	"		"
					Dia.		NX?
					"		Rcd
5.5	10.5	Quartzite, coarse grained, grn to white to gry, no bedding, breaks horizontal, pieces from 0.1 to ?.?', fractures with staining at 20 degrees to core, tan from 9.0 to 10.0', average piece 0.4' long.					
10.5	12.2	Quartzite, coarse grained, grv with streaks of red, red siltstone inter-bedded - can be scratched easily with fingernail. Fracture at 45 degrees to core, heavy staining, pieces from 0.05' to 0.6' long, average ?.3', badly broken below 11.8', siltstone and fracture at 11.?' and 10.7', no definite bedding, siltstone deformed.					
12.2	14.0	Quartzite, med. grained, grn with white and red specks, fracture at 20 degr[ees] pieces from ?.?5' to 0.4' long, average 0.3', slight staining along fractur[es]					
14.0	16.3	Quartzite, gry, fine grained, bedded with slight crossbedding, one fracture 75 degree angle to core, stained, pieces from 1.7' to ?.2' long, durable.					
16.3		Bottom of hole WL (11/2/65) 0.?'					

DH 5, ELEV. 1116.5, 8+40, Centerline
Logged by: H. Marien 11/4/65
Drilling Equipment: Acker T?

Hole From	Depth To	Description of Materials	Unif. Soil Class Symb.	STANDARD PENETRATION Blows Per 6"	Type Bit Used	No.	Ty[pe]
0.0	0.4	Forest litter, topsoil, etc.		1-?-7	SpT	1	Jar
0.4	2.0	Sand, gravelly, lt. brn, moist, 15% low plastic fines, 15% fine subrounded gravel (quartzite), sand is well graded.	?	47	"	2	"
					Dia.	1	NX?
2.0	25.8	Quartzite, med. to coarse, greenish with red and white particles, badly broken to 18.0', broken to fine gravel, in places weathered, heavy staining, black and orange along fractures, fractures at 20 degrees, and 75% to core, vague bedding of pieces from 0.05' to 0.3' long, average 0.1', thin tan sandstone layers above 18.4', pieces greater than 0.2' in length below 18.?', average 0.8' in length, vertical fractures above 21.0', core becomes more red and has red siltstone inclusion at 24.?', siltstone can be scratched with a knife, quartzite can be too, but with difficulty.			"	2	"
					"	3	"
					"	4	"
					"	5	"
					"	6	"
					"	7	"
					"	8	"
					"	9	"
25.8	29.0	Quartzite, med. grained, reddish gry, bedded and crossbedded, vertical fractures and heavy dk. gry staining, pieces average 1' long, 27.5' siltstone lenses appear 0.02' thick. Two can be scratched easily with knife, dip of 8 degrees, gradational contact.					
29.0	34.0	Quartzite, fine grained, brn-red, bedding not apparent, fractures show dk. gry and blue black staining, crossbedded, pieces slightly micaceous, average 1.0' long, badly broken below 33.0' and inter-bedded with weathered siltstone, pieces there are disks 0.05' thick, can be scratched only with knife, breaks along dip, dip of 8 degrees, distinct contact.					
34.0	37.6	Quartzite conglomerated, coarse grained, approximately 35% particles larger reddish gry, crossbedded, fractures horizontal, pieces from 0.1' to 1.5' lo[ng] dk. gry and tan, med. staining along fractures, interbedded with siltstone broken and weathered.					
37.6	50.0	Sandstone, med. to fine grained, slightly (5%) micaceous, red-brn except fr[om] 45.0 to 45.6', and 27.0 to 47.2' where it is gry grn, pieces from 0.4' to ? 2.0', slight staining along fractures, fractures and breaks at 80 degrees crossbedding, red with white conglomerate zone from 47.9 to 48.3', no voids only with knife. WL (11/5/65) 23.3'					

DH 6, ELEV. 1107.8?, 7+86, Centerline
Logged by: H. E. Marien 11/23/65
Drilling Equipment:

Hole From	Depth To	Description of Materials	Unif. Soil Class Symb.	Type Bit Used	No.	Ty[pe]
0.0	0.5	Forest litter, roots, etc.		Dia.	1	NX?
0.5	4.5	Sands, silts and gravel, earth boring to 4.5'		"	2	"
4.5	14.0	Quartzite, med. grained, gry-grn, red siltstone inclusions 7.0-8.0', badly broken above 11.0' into gravel, orange and black staining, vague crossbedding. WL (11/24/65) 14.0'		"	3	"
				"	4	"

, med. grained, well graded, tan to white, vague bedding, 0.5' long piece, may be cobble.
, med. to fine grained, red, to greyish red, vague bedding, 0.1' lense of coarse sand-
9.2', badly broken and weathered near top, unweathered below 8.9', mud seam at 7.7',
ed, break into pieces 0.3 to 0.5' in length. Along bedding, slight staining.
, coarse grained, sorted, bedded, gry with some red, porous, orange staining, pieces
.5' long.
, med. to fine grained, reddish brn, grades into tan at 12.0', bedded, 2 pieces 0.2'
brn-blk, staining, broken along bedding.

Centerline, 5+70
rien 1/26/65
cker

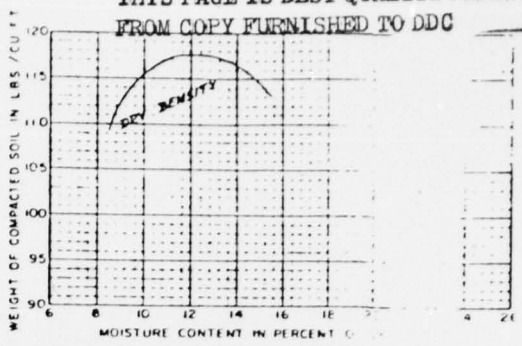
ion of Materials	Unif. Soil Class Symb.	STANDARD PENETRATION Blows Per 6"	Type Bit Used	No.	Type	SAMPLES From Ft.	To Ft.	% Rec.
gravel, brn, wet, trace fines	SW	9-41	Spl	1	Jar	0.0	1.0	30
cobbles, 20% gravel.						1.0	1.5	0
had to core.		7-7-8	SpT	2	"	1.5	3.0	60
silt and gravel, brn, wet,	SM	39-30-26	"	3	"	3.0	4.5	55
plastic fines, 15% well graded		47-79	"		"	4.5	5.5	0
trace of cobbles, sand is well			Dia.		NXM	5.5	9.0	65
ed. to fine.			"		Rcd.	9.0	11.8	100
, coarse grained, grn to white						11.8	14.4	97
no bedding, breaks horizontal,						14.4	16.3	100
rom 0.1 to 0.6', fractures with								
at 20 degrees to core, tan from								
.0', average piece 0.4' long.								
, coarse grained, grv with								
of red, red siltstone inter-								
can be scratched easily with								
il. Fracture at 45 degrees to								
avy staining, pieces from 0.05'								
long, average .3', badly broken								
.8', siltstone and fracture at 11.0'								
, no definite bedding, siltstone deformed.								
, med. grained, grn with white and red specks, fracture at 20 degrees to core								
rom 0.05' to 0.4' long, average 0.2', slight staining along fractures.								
, gry, fine grained, bedded with slight crossbedding, one fracture at 16.0' at								
angle to core, stained, pieces from 1.7' to 4.2' long, durable.								
hole WL (11/2/65) 0.0'								

+40, Centerline
11/4/65
cker T

ion of Materials	Unif. Soil Class Symb.	STANDARD PENETRATION Blows Per 6"	Type Bit Used	No.	Type	SAMPLES From Ft.	To Ft.	% Rec.
itter, topsoil, etc.		1-4-7	SpT	1	Jar	0.0	1.5	80
uvelly, lt. brn, moist, 15%	SC	47	"	2	"	1.5	2.0	60
tic fines, 15% fine subrounded			Dia.	1	NXM	2.0	4.0	75
quartzite), sand is well			"	2	"	4.0	5.3	61
				3	"	5.3	8.0	50
e, med. to coarse, greenish				4	"	8.0	11.6	50
and white particles, badly				5	"	11.6	14.4	79
o 18.0', broken to fine gravel,				6	"	14.4	16.6	100
s weathered, heavy staining,				7	"	16.6	21.0	100
d orange along fractures,				8	"	21.0	26.0	98
s at 20 degrees, and 75° to				9	"	26.0	30.0	100
gue bedding of pieces from 0.05'						30.0	32.0	9
long, average 0.1', thin tan								
e layers above 18.4', pieces								
than 0.2' in length below 18.0',								
0.8' in length, vertical fractures								
.0', core becomes more red and les								
stone inclusion at 24.0', siltstone can be								
d with a knife, quartzite can be too, but								
fficulty.								
e, med. grained, reddish gry, bedded and								
ded, vertical fractures and heavy dk. gry								
pieces average 1' long, 27.5' siltstone								
ppear 0.02' thick. Two can be scratched								
ith knife, dip of 8 degrees, gradational								
e, fine grained, brn-red, bedding not								
fractures show dk. gry and blue black								
crossbedded, pieces slightly micaceous,								
.0' long, badly broken below 33.0' and inter-								
ith weathered siltstone, pieces there are disks								
ick, can be scratched only with knife, breaks								
o, dip of 8 degrees, distinct contact.								
e conglomerated, coarse grained, approximately 35% particles larger than sand size,								
gry, crossbedded, fractures horizontal, pieces from 0.1' to 1.5' long, average 0.8',								
and tan, med. staining along fractures, interbedded with siltstone at 37.6', here it is								
d weathered.								
e, med. to fine grained, slightly (5%) micaceous, red-brn except from 41.7 to 42.7',								
45.6', and 27.0 to 47.2' where it is gry grn, pieces from 0.4' to 4.0' long, average								
ight staining along fractures, fractures and breaks at 80 degrees to core, slight								
ding, red with white conglomerate zone from 47.9 to 48.3', no voids, can be scratched								
h knife. WL (11/5/65) 21.3'								

7+86, Centerline
rien 11/23/65

ion of Materials	Unif. Soil Class Symb.	Type Bit Used	No	Type	SAMPLES From Ft.	To Ft.	% Rec.
itter, roots, etc.		Dia.	1	NXM	4.5	6.5	45
ilts and gravel, earth boring to 4.5'		"	2	"	6.5	8.5	96
e, med. grained, gry-grn, red siltstone		"	3	"	8.5	11.5	35
ns 7.0-8.0', badly broken above 11.0' into		"	4	"	11.5	14.0	88
orange and black staining, vague crossbedding.							
(11/24/65) 14.0'							

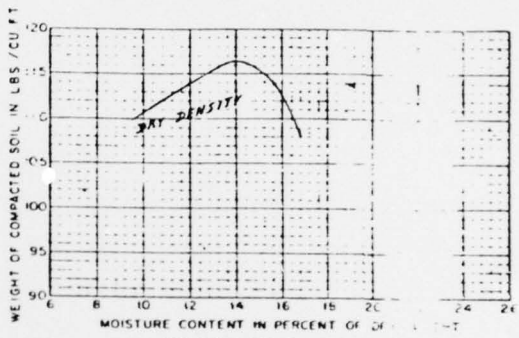


COMPACTION CURVE

LABORATORY SAMPLE NO. 66 N 1701 (SC)

ASTM DESIGNATION D-698 METHOD A

SOIL SIMILAR TO TP-117, DEPTH 0.6' TO 6.5'
(TESTED FOR PA-422, TP-101 DEPTH 1.0' TO 4.5')

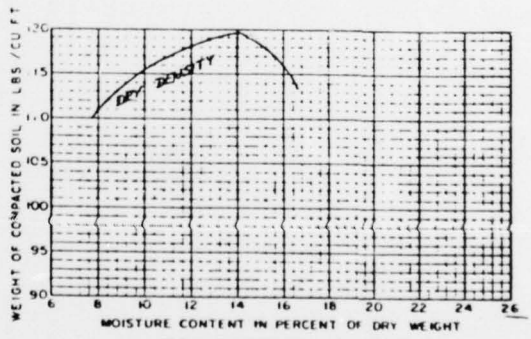


COMPACTION CURVE

LABORATORY SAMPLE NO. 66 N 1902 (GM)

ASTM DESIGNATION D-698 METHOD A

TP-113 DEPTH 1.0' TO 10.5'



COMPACTION CURVE

LABORATORY SAMPLE NO. 66 N 1903 (GC)

ASTM DESIGNATION D-698 METHOD A

SOIL SIMILAR TO TP-120 DEPTH 0.6' TO 8.0'
(TESTED FOR PA-422, TP-152, DEPTH 1.0' TO 3.5')

TYPICAL SOIL DATA DETAILS
NEIFERT CREEK DAM

NAT. ID NO. PA.00654 SCHUYLKILL COUNTY

DATA OBTAINED FROM U.S. DEPT. OF AGRICULTURE, SOIL CONSERVATION SERVICE, SHEET 13 OF 15, DRAWING NO. PA-422A-P, DATED APRIL 1966

PLATE 7

APPENDIX

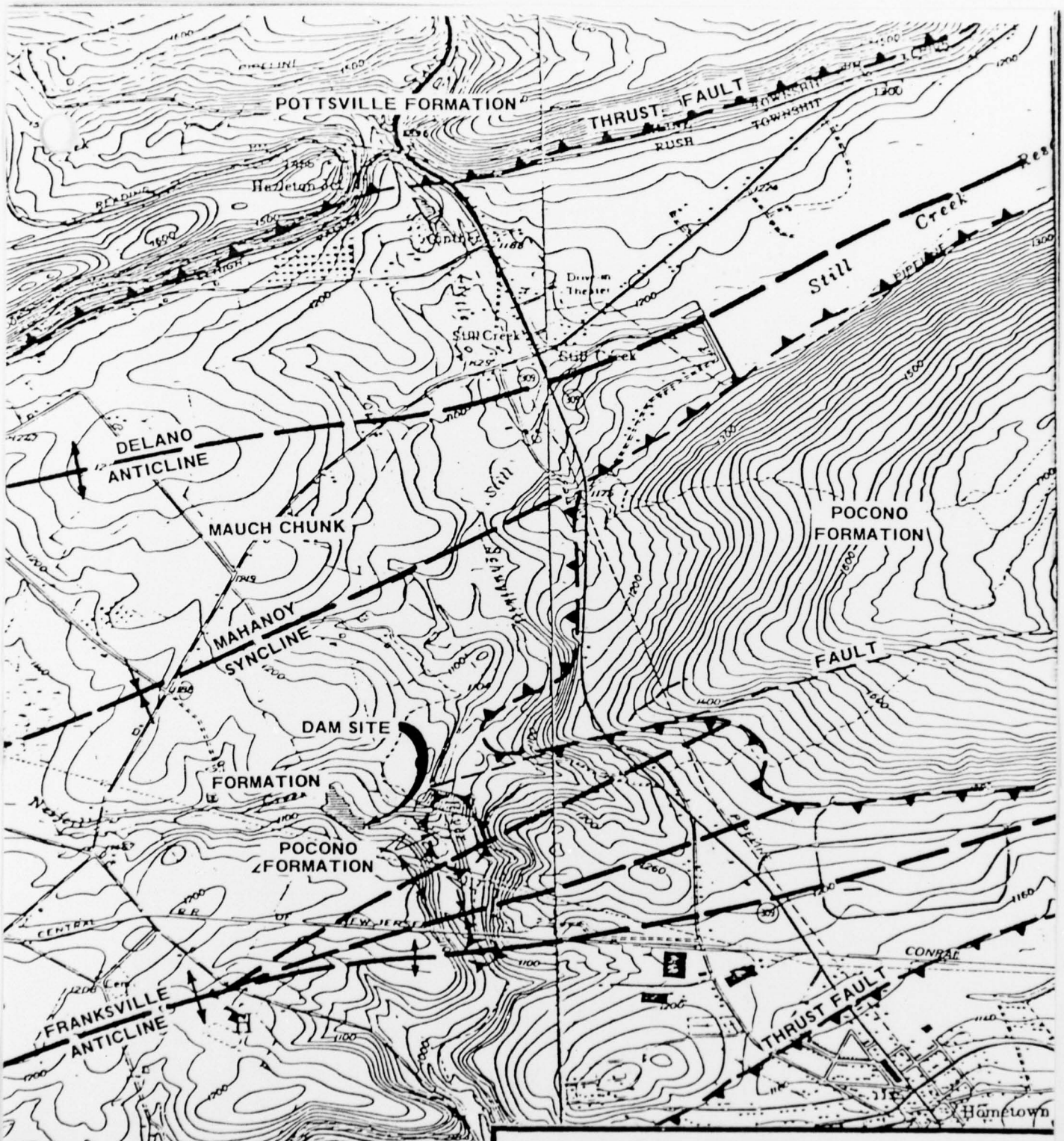
F

SITE GEOLOGY
NEIFERT CREEK DAM

Neifert Creek Dam is located in the Appalachian Mountain Section of the Valley and Ridge Physiographic Province. As shown in Plate F-1, the dam is located in the sandstone and shale Mauch Creek Formation of Mississippian age. In the left abutment area, bedrock strikes northwest and dips approximately 15 degrees to the southwest (upstream direction). Jointing strikes east-northeast (perpendicular to dam) with near-vertical dips to the north. Another joint set strikes near north-south with near-vertical dips to the west (upstream direction).

The dam lies between two regional east-northeast trending folds in an area of localized thrust faulting. Several faults occur approximately 1,000 feet to the rear near Little Schuylkill River Dam. One is a low angle thrust fault with an elliptical fault trace due to erosion which formed the present Little Schuylkill River valley. The other fault strikes east-northeast with a sense of movement of down-to-the south.

The combination of northwest striking bedding and east-northeast striking joint planes would be conducive to downstream springs water seeps (as noted by the inflow of water near the north bank of Neifert Creek). Problems of water seepage are not considered to be significant since this dam is a flood control structure and is not expected to be at maximum capacity for extended periods.



SITE GEOLOGIC MAP
NEIFERT CREEK DAM

NAT. ID NO. PA.00654 SCHUYLKILL COUNTY

DATA OBTAINED FROM U.S. GEOLOGICAL SURVEY
MAPS GQ-1054 AND GQ-1133

PLATE F-1